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THE

AMERICAN JOURNAL

OF THE MEDICAL SCIENCES.

JANUARY, 1895.

BASAL HERNIAS OF THE BRAIN.

By Christian Fenger, M.D.,
PROFESSOR OF CLINICAL SURGERY, NORTHWESTERN UNIVERSITY MEDICAL SCHOOL AND CHICAGO POLYCLINIC, CHICAGO.

While the occipital and sincipital cerebral hernias form external visible tumors in the occipital and naso-frontal regions respectively, we find no external visible tumors in the basal hernias. As the sincipital hernias, however, leave the cranium in close proximity to the place of exit of the basal hernias, let us first review briefly the various forms of sincipital hernias:

1. The naso-frontal hernias leave the cranium between the frontal and nasal bones and form a tumor in the median line in the region of the glabella.

2. The naso-ethmoidal hernias leave the cranium between the frontal and nasal bones on the one side and the lateral mass or labyrinth on the other, which is forced or displaced downward toward the nasal cavity. The tumor appears externally in the region of the border between the osseous and cartilaginous portions of the nose, hanging down toward the tip or the wing of the nose.

3. The naso-orbital hernias leave the cranium between the frontal, ethmoid and lachrymal bones. In the region of the latter they enter the orbit and present at or near the inner canthus of the eye.

All the above-named varieties present external visible tumors. The naso-ethmoidal and naso-orbital varieties are probably not distinguishable from each other, as they leave the cranium at the same place; namely, the nasal notch of the frontal and the cribriform plate of the ethmoid bone. Furthermore, the same hernia may divide into two branches, of which the anterior passes downward and forward behind the nasal bone, to protrude in the face at the border of the osseous and cartilaginous part of the nose, and the posterior branch descends into the anterior and medial portion of the orbit between the frontal, ethmoid and lachrymal bones. There is always some defect of the bones in question at the point where the encephalocele leaves the cranium.

4. Basal hernias are, as already stated, distinguished from the other sincipital hernias by not causing a protruding tumor in the face. Heinecke[6] distinguishes between three forms of these hernias:

I. Cephalocele spheno-pharyngea is the most common variety, and leaves the cranium through an opening between the body of the sphenoid bone and the ethmoid bone, or through one of these bones, to come down in the nasal or naso-pharyngeal cavity. Extending from this point they may present in one of the nostrils, as in Czerny's case; in the naso-pharyngeal cavity as in the cases of Giraldès, Otto, and Klimentowsky, cited from Larger,[11] and in my case, or come down into the mouth through a cleft palate, as in the cases reported by Virchow, Lichtenberg, Klintosch and Serres, also cited from Larger.

II. Cephalocele spheno-orbitalis, which leaves the cranium through the superior orbital fissure to enter the orbit behind the globe of the eye.

III. Cephalocele spheno-maxillaris, which, like the second form, leaves the cranium through the superior orbital fissure, but instead of remaining in the posterior part of the orbit, descends through the inferior orbital fissure into the spheno-maxillary fossa. The tumor presents, and can be felt in the mouth on the medial side of the ascending ramus of the inferior maxilla, and is visible on the outside of the face, on the cheek below the zygoma, in the same place where the retro-maxillary branches of retro-nasal fibroids present.

The two last-named hernias are exceedingly rare, and I have been unable to find all the varieties to which Heinecke's classification refers. Larger mentions three instances of retro-orbital encephalocele referred to by Spring. In the case published by Walther, the tumor descended through the superior orbital fissure, and caused exophthalmos and destruction of the eye. Spring had seen two similar specimens in the museum at Bonn.

The first variety, the spheno-pharyngeal, is less uncommon. I shall mention the more accurately described instances of this variety, as they present more of surgical interest than Heinecke ascribed to them when he said: "Cephalocele basalis is of no surgical importance, as it has been found only in non-viable monsters (*nicht lebensfähigen Missbildungen*)."

Attempts at the removal of encephalocele by operation have been made by Lichtenberg, Czerny and myself. Lichtenberg's patient died from the operation; Czerny's patient survived the operation, but died later from apparently independent causes; my patient made a definite recovery.

Lichtenberg[12] reports the case of a newborn girl in whom a large reddish tumor, the size of a small fist, hung out of the mouth, covering the chin, with its base resting on the sternum. On more minute examination it was seen that the patient had a hare-lip situated nearly in the median line of the lip, and complicated with cleft palate. The tumor was divided into two portions by a slight constriction in the middle, was elastic to the touch, and was attached by a pedicle which could be followed up to the right wall of the nasal cavity by opening the mouth, where it was continuous with the nasal mucosa. The patient died from the operation, and the autopsy demonstrated that the tumor was a cerebral hernia.

Klintosch[10] gives a vague description of an infant in whom a tumor protruded in the mouth. The patient had a hare-lip and cleft palate, some bones of the face were wanting, and the eyes were atrophied. In the sella Turcica was an opening the size of a goose-quill through which the neck of the hernia came down into the mouth, there to form a tumor the size of a hazelnut. This contained the hypophysis, which was hollow and communicated directly with the ventricle.

Serres[15] describes an infant in whom some portions of the brain, with their envelopes, protruded from the cranium in the median line between the sphenoid and ethmoid bones. The tumor descended into the nasal fossa, almost into the pharynx.

Giraldès,[5] according to Dupuytren,[3] observed an encephalocele which descended into the interior of the nose.

Otto,[13] cited by Spring, states that he has seen in the museum at Vienna a cerebral tumor which had penetrated into the nasal cavity through the cribriform plate of the ethmoid.

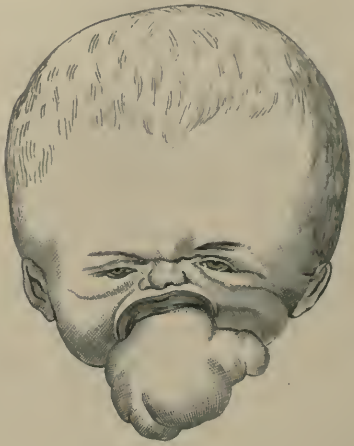
Kelsch,[8] according to Otto, has seen a case in which the hypophysis was situated in the sphenoidal sinus.

Klimentowsky,[9] describes an encephalocele in a newborn child, in which the anterior portion of the two frontal lobes descended into the right side of the nasal cavity, as was verified by the autopsy.

Rippmann,[14] cited by Meyer, found in a fœtus of twenty-three weeks, the head of which was double the normal size, and consequently hydrocephalic, a lobulated tumor having a pedicle three or four lines in thickness, which descended through a canal in the body of the sphenoid bone.

Virchow[17] describes a specimen in the Berlin museum, of hydrencephalocele palatina in a newborn child. (See Fig. 1.) From the open mouth protruded an irregular nodulated tumor the size of a small apple. It was apparently adherent to the hard palate, but upon section it was seen that it had pushed both the vomer and the hard palate forward and upward, and that it emerged from the cranial cavity through a broad opening immediately anterior to the sphenoid bone, and behind the still cartilaginous ethmoid. The anterior portion of the sphenoid was forced downward and backward, and the connection between it and the vomer interrupted by the tumor, so that the vomer was connected only with the ethmoid. The anterior portion of the sac contained a cavity lined with smooth dura mater, below and behind which were several irregular smaller cavities. In the upper portion of the tumor was brain substance which extended from this point up into the cerebral portion of the cranial cavity. The brain was pushed downward toward the base of the cranial cavity, and above it was a large cavity filled with fluid, and surrounded by a thick membrane.

FIG. 1.



In addition to this more or less cursory discussion of cases from the older literature, there has now appeared an accurate and excellent report of a case by Meyer,[19] from Czerny's clinic. The case was one of congenital nasal polypus, and was brought to the Heidelberg clinic for operation. The child died six weeks later, and the diagnosis was made after post-mortem microscopical examination.

The patient was a child three days old, well developed, weighing five or six pounds. The left ala nasi was broadened and pushed upward by a soft, elastic, compressible, pedunculated, transparent tumor the size of a hazelnut, half of which protruded through the opening of the nose, and was clad with smooth, yellowish-red mucous membrane, and covered with dried crusts of serous exudate. The tumor did not increase in size when the child cried; it was attached 1½ cm. behind the free border of the septum. Upon incision of the tumor bloody serum escaped, and upon pressure puriform mucus was forced out.

On October 22, 1888, the left ala nasi was divided at its line of insertion and pushed upward. The pedicle was tied off by a double ligature and divided, and the tumor removed. The external wound was united, and an iodoform gauze-collodion dressing applied. This dressing was at first changed every day; later on, every two or three days. A serous discharge continued from the nose. The wound healed, and the child did well for a few weeks; then it suffered gradual loss of strength, and died six weeks after the operation from marasmus. There was no meningitis.

The autopsy revealed that the wound was healed. The left eye was located obliquely, so that the left inner canthus was 2 or 3 mm. deeper than the right. In the left nostril was a polypoid grayish-red tumor, which extended nearly to the external opening. The fontanelles were broad and large. The subarachnoid fluid was somewhat increased. The meninges in the right central fissure were opaque, and the left frontal lobe less prominent than the right, as if it had sunk back.

The left frontal lobe could not be lifted up from the frontal fossa, but was fixed by a flattened string or band 1 cm. in antero-posterior diameter, and clad with vascular meninges. The pedicle made its exit from the cranium through a longitudinal, oval, funnel-shaped opening 1 cm. long and ½ cm. broad in the cribriform plate of the ethmoid bone. It was smooth, hard, the size of a goose-quill, and descended into the posterior nares, and divided into two branches, one of which formed the polypus, while the other was adherent to the posterior border of the hard palate. The nasal septum was deviated to the right side, and the middle meatus of the nose absent. The left nostril was much larger than the right.

Meyer remarks that it is possible that basal encephaloceles are more common than would appear from the literature, but that they have been mistaken for nasal polypi, which they resemble, and have not been recognized as hernias of the brain.

As a result of research in the literature on the diseases of the nose, for which I am indebted to the kindness of Dr. George Morganthau, the two following cases have been found:

Abraham[1] demonstrated a case on February 1, 1889, before the West London Medico-Chirurgical Society:

The patient was a man thirty-one years of age, who had a meningocele which occupied the greater part of the nose and originated beneath the nasal bones. After birth the tumor was relatively of the same size until 1883, when it became inflamed as a result of injury, and was incised, whereupon blood and "water" escaped. The watery discharge continued for about a day, when the wound of incision closed. At the time of demonstration the tumor was 2½ inches in length and diameter, and showed expansile pulsation, which was registered graphically and showed rapid systolic uprise and well-marked dicrotic impulse. These phenomena were only slightly affected by respiration.

Tilleux[16] reports the case of a man who, following the removal of a nasal polypus, commenced to suffer from a profuse watery discharge from the nose, which persisted during the entire twenty-four hours, excepting when the patient was recumbent. When the head was bent forward the discharge seemed to increase. The amount of discharge in the twenty-four hours was about nine ounces. Upon analysis the fluid was found to be identical with arachnoid fluid. Tilleux therefore supposed that in the extraction of the polypus the cribriform plate of the ethmoid had been broken, and that the discharge occurred from the arachnoid cavity.

On March 16, 1891, I operated on a case of basal hydrencephalocele simulating nasal polypus, in which the compressibility of the tumor led me to suspect basal hernia before the operation, although I found it impossible to make a positive diagnosis until the polypus had been removed. I reported this case, and exhibited the specimen and patient, before the Chicago Medical Society, March 7, 1892. The case is as follows:

Case.—*Synopsis: Symptoms of obstruction of nose from early childhood. Pedunculated polypus in left posterior nares, apparently somewhat compressible, pedicle located at root of nose. Suspicion of cerebral hernia. Attempt at positive diagnosis by aspiration of cerebro-spinal fluid from polypus failed. Removal of polypus by écraseur, followed by free discharge of cerebro-spinal fluid. Packing of left nostril with iodoform gauze, preparatory to radical operation to close hollow pedicle. Osteoplastic resection of superior maxilla as devised by Von Langenbeck. Pedicle found, transfixed, and ligated. Recovery.* A. A., Swede, single, twenty-nine years of age, coachman, came to my clinic at the College of Physicians and Surgeons March 4, 1891. Parents living and healthy; none of his brothers or sisters died at birth or in early life; no cranial or cerebral deformities in the family. The patient has had the usual diseases of childhood, and has also had occasional headaches. Even when he was a boy he could not blow his nose satisfactorily; there was no discharge at all. Two years before he had difficulty in breathing through the nose, and consulted an advertising specialist, who claimed that he removed a growth from the nose. The operation was attended by slight hemorrhage, but no serous fluid escaped. He could breathe well for a few days, but the nostrils soon became again obstructed.

Upon examination at the clinic I found a tumor filling the post-nasal space above the soft palate. On palpation with the index finger the tumor seemed somewhat compressible. As I thought the case might possibly be one of cerebral hernia containing fluid, I refused to operate, and told the patient to come to my office for further examination before deciding upon the method of treatment.

He came repeatedly to my office, and at each examination the tumor would upon pressure appear to decrease in size so that it could be pushed up into the left half of the posterior nares. It would remain small in size and in this location for a time, but within twenty-four hours would be as large and would occupy the same position as before. I could not see the tumor nor its pedicle from the nostril, but upon examination with the probe I thought I could trace the pedicle to the roof of the nose.

The suspicion of cerebral hernia made me consider the various operations for this condition. As ligature high up, near the base of the cranium would be called for, the operation necessary to gain access to this point would be somewhat grave. The choice of operations, therefore, lay between (*a*) temporary transverse resection of the nose at its

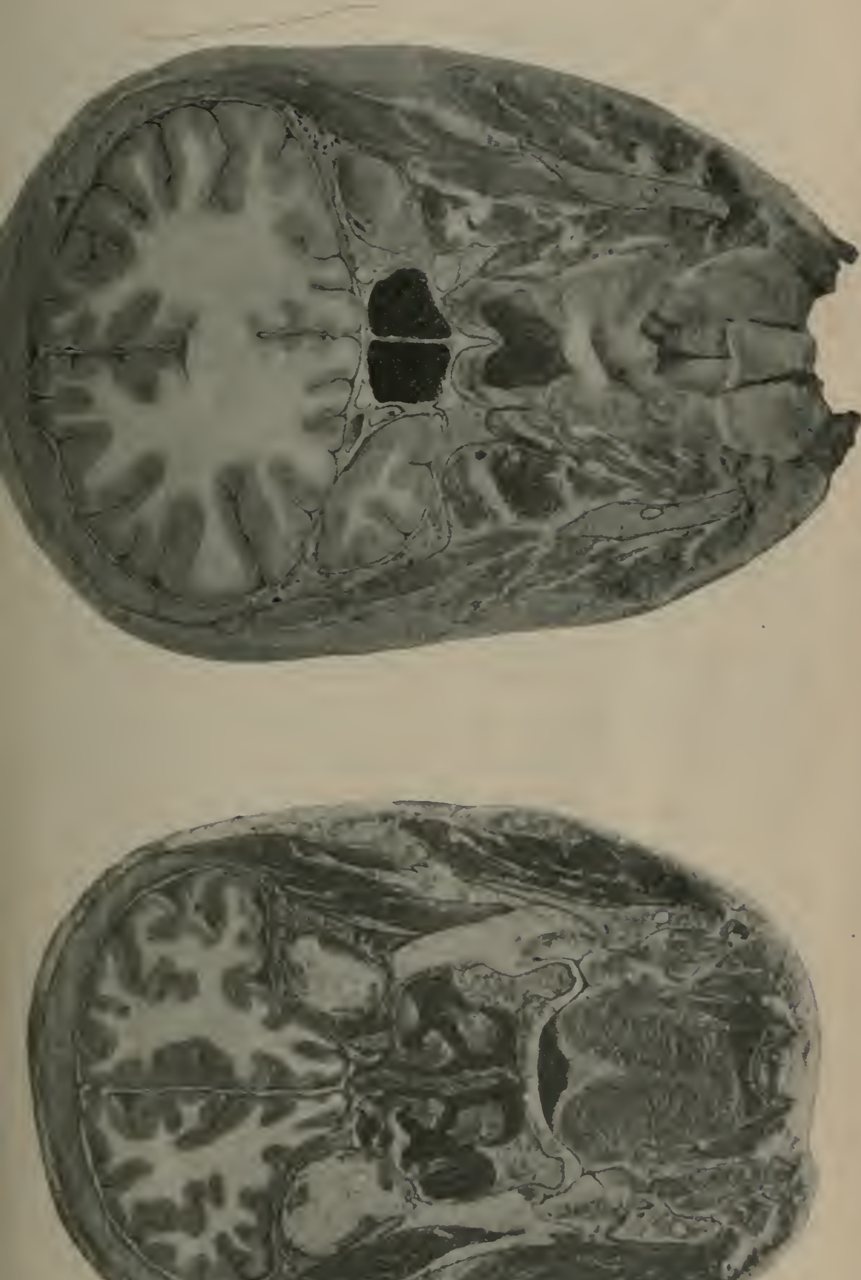


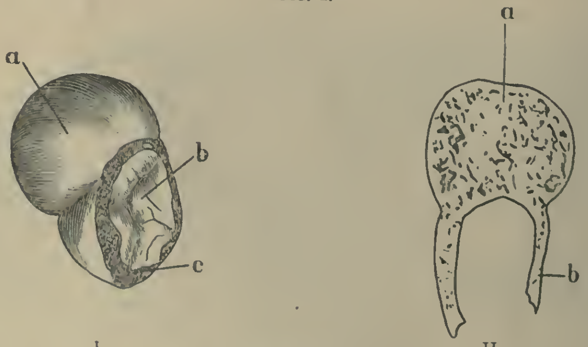
PLATE SHOWING THE EXTENT TO WHICH THE CEREBRUM DESCENDS UPON THE CRANIAL BASE. (McEwen's *Atlas of Head Sections*, Series A, Plates 2 and 4.)

root, as devised by Ollier and Von Bruns; (*b*) temporary division of the hard palate close to the median line, as devised by Annandale; and (*c*) temporary resection of the upper maxilla, as devised by Von Langenbeck.

As these operations preparatory to access are so grave, I did not wish to undertake any one of them on an uncertain diagnosis. On May 14th, therefore, I attempted to make the diagnosis certain by aspiration with the hypodermatic syringe at my office. I palpated the tumor with my left index finger. It was in the usual position—above the soft palate, behind the posterior nares. Without compressing the tumor I pushed a hypodermatic needle through the soft palate up into the tumor, and my assistant, Dr. Hall, withdrew the piston, but no fluid appeared. When this had been twice tried with negative results, I concluded that the tumor was an ordinary polypus and not a basal hernia, and proceeded to remove the growth in the usual way with the wire snare. The loop was introduced through the left nostril, carried over the tumor with the left index finger, and tightened with the écraseur until resistance was encountered. I could now locate the tumor as being fixed to the roof of the nose between its middle and posterior thirds. I tightened the écraseur and divided the pedicle. After withdrawal of the snare slight hemorrhage occurred, but neither coughing nor sneezing brought forth the tumor. The hemorrhage soon ceased, but was immediately followed by dripping of a clear watery fluid, of which I collected about a teaspoonful in a watch-glass. This fluid upon being boiled showed the presence of a small amount of albumin, and upon the addition of nitrate of silver gave the characteristic white precipitate of chloride of silver.

As I concluded that the fluid was cerebro-spinal, and as I desired to examine the tumor to make the diagnosis positive, I made the patient vomit, and this brought forth the tumor as shown in Fig. 2. The tumor when empty was of the size of a hazelnut and consisted of two portions—a solid distal and a hollow proximal portion. The solid distal portion was spherical, 18 mm. broad and 13 mm. deep, was covered with smooth

FIG. 2.



I. II.

I. TUMOR—NATURAL SIZE.

a. Solid portion of tumor. *b* Cavity in pedicle of tumor. *c.* Divided border of pedicle.

II. CROSS SECTION OF TUMOR AND HOLLOW PEDICLE.

a. Solid portion of tumor. *b.* Wall of pedicle.

mucosa, resembling in color a fibrous polypus of the nose. The hollow proximal portion of the tumor, which was separated from the distal portion by a groove, was 15 mm. in all its diameters. At the point of division the cavity was 1.5 by 1 mm. in diameter, and had a wall 2 mm. thick covered with smooth mucous membrane. The interior surface of the cavity was smooth, whitish, and showed distinctly dendritic vessels.

I now knew that I had to deal with a hollow pedicle of the diameter mentioned, which communicated with the cranial cavity and was probably in direct connection with one of the cerebral ventricles.

The left nostril was thoroughly cleansed with 1:1000 bichloride solution, packed with iodoform gauze, and the patient immediately taken to the Emergency Hospital. He felt perfectly well, and when lying down nothing was noticeable, but when he sat up with the head bent forward, a discharge of clear cerebro-spinal fluid occurred from the left nostril.

The further plan of operation now came under consideration. The basis of this plan was to secure the pedicle for transfixion and ligature as close to its exit from the cranium as possible; that is, the nasal surface of the cribriform plate of the ethmoid bone. Taking into consideration the location of the pedicle, partly from what I had observed during the operation at my office and partly from our knowledge of the places of exit of basal hernias, I located the opening near the anterior border of the body of the sphenoid bone about 2 cm. anterior to the border of the posterior nares.

I found by investigation upon the cadaver that in order to gain access to the place of exit of the hernia, not simply for the scraping or cutting off of a tumor, but to obtain sufficient space for manipulation—that is, to pass a needle through the pedicle for transfixion or ligation—neither temporary resection of the nasal bone nor Annandale's longitudinal division of the hard palate and separation of the divided portions would give me the space required, but that the osteoplastic or temporary resection of the superior maxilla as devised by Von Langenbeck would enable me to deal satisfactorily with the pedicle.

This operation was accordingly proposed and executed on March 16th in the presence of the doctors from the Chicago Polyclinic, and with the assistance of Drs. Hall and Bernauer, in the following manner: The patient was anæsthetized with chloroform and placed in Rose's position, the mouth held open by Heister's gag, and a loop of heavy silk passed through the tongue.

An incision was made from the internal canthus of the left eye along the infra-orbital border and outward over the malar bone to its junction with the frontal bone, then downward over the anterior portion of the zygomatic arch to its lower border, and from here forward along the lower border of the malar bone inward and upward to the upper border of the wing of the nose. The base of the flap thus formed was the skin between the ala of the nose and the internal canthus of the eye. The incision having been carried down to the bone, the masseter was divided at its origin on the lower border of the malar bone and detached with the periosteum from the bone by a periosteal elevator. The elevator was pushed inward along the posterior surface of the superior maxilla through the spheno-palatine foramen, where it could be felt by the left index finger, and the contents of the orbit loosened from the floor and the outer border for three quarters of an inch along the line of incision.

I now divided the zygomatic arch with bone-scissors and introduced a metacarpal saw through the spheno-palatine foramen into the nose, with the cutting edge upward, and divided the bony structures in the posterior wall of the antrum of Highmore, namely, the frontal process of the malar bone and the upper part of the posterior surface of the body of the upper maxilla. Then, bringing the handle of the saw forward, I cut through the bony floor at the orbit or the upper wall of the antrum of Highmore to the posterior border of the frontal process of the superior maxilla. The saw was now withdrawn and replaced in its first position through the spheno-palatine foramen, but with its edge directed downward and forward, and the lower half of the body of the maxilla divided on a line corresponding with the lower portion of the incision, from behind forward and finally upward, terminating in the pyriform aperture of the nose. The saw was now withdrawn and the periosteal elevator passed into the spheno-palatine foramen, and the divided portion of the upper maxilla, now attached only by its nasal process to the frontal and nasal bones, lifted out after fracture of this process.

This part of the operation was attended with considerable hemorrhage through the wound, the mouth and the nose.

The resected portion attached to the skin flap was now displaced upward on the patient's forehead, which exposed and made readily accessible the left half of the nasal cavity and the antrum of Highmore.

I now found without difficulty the pedicle of the tumor, 2 cm. long, 1 cm. broad, and flattened so as to be about 6 or 7 mm. in thickness. The distal end of the pedicle terminated in a ragged surface where the écraseur had cut through, and showed distinctly a smooth outer surface, a large cavity, and a smooth inner surface, with no redness, swelling, or other signs of inflammation.

The end of the pedicle was grasped by Kocher's artery-forceps, and transfixion and double ligature close to the roof of the nose, performed. The space for this purpose was not very abundant, and a very short needle was employed to pass a silk thread through the middle of the pedicle at about ½ cm. to 1 cm. from the cribriform plate of the ethmoid. The pedicle was thus ligated in halves, and in addition one of the ligatures was passed around the entire pedicle. The ends of the ligatures were cut short.

The pedicle was now enveloped in iodoform gauze, which was packed very carefully along the upper third of the nose. The resected portion of the superior maxilla was replaced and the remainder of the nostrils packed with iodoform gauze. A separate packing of iodoform gauze filled the antrum of Highmore and was brought out through the lower border of the wound, while the ends of the strips used in packing the nose were brought out through the left nostril. A drainage-tube was placed beside the gauze packing in the antrum, the rest of the wound united and the usual dressing applied.

Notwithstanding the severe hemorrhage, the patient's pulse at the close of the operation was 88, and the temperature never exceeded 100.5° F., a point which it reached during the first week, but came down to normal in the second week. The pulse was 110 on the second and third evenings, 90 at other times, and was normal after the middle of the second week.

The patient was allowed to sit up after three weeks. In the fifth week, two small pieces of bone were discharged from the drainage-opening.

On June 1, ten weeks after the operation, the wound was so nearly closed that collodion dressing could be applied over the fistula leading in to the antrum, which remained open for about three months, but secreted little and did not interfere with the patient's work as coachman.

The accompanying photographs of the patient (Figures 3 and 4) show a face of ordinarily intelligent expression, the left eye a little more open than the right from division of some fibres of the seventh nerve distributed to the orbicularis palpebrarum. He can close the eye voluntarily. On the cheek is seen a fine linear cicatrix, which marks the line of incision for the osteoplastic resection; and at the lower border of the malar bone there is a depressed cicatrix corresponding to the site of the drainage-tube into the antrum. The left ala of the nose is slightly flattened; this is the only indication of any asymmetry between the two halves of the face, and I am unable to state whether this flattening existed prior to the operation.

FIG. 3.

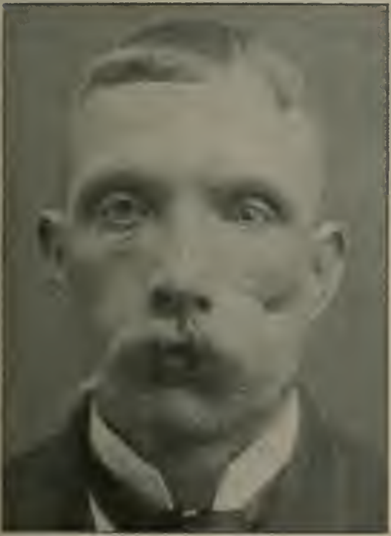
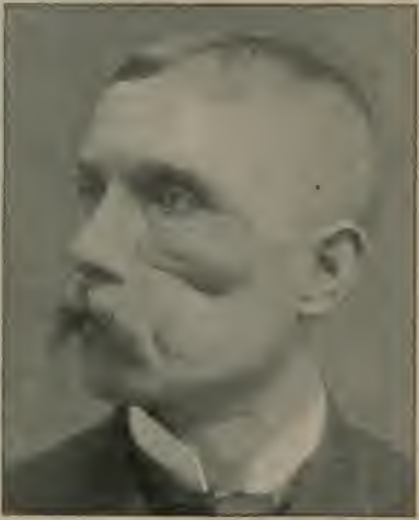


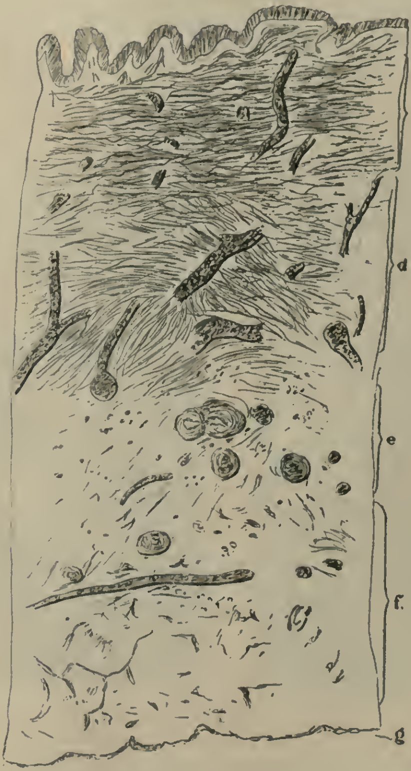
FIG. 4.



Besides this feature there is only one condition in the patient's face which has attracted my attention, and that is that the root of the nose is abnormally broad, and consequently the distance between the eyes is unusually great. The distance between the internal canthi of the eyes is 45 mm., which is 10 to 12 mm. in excess of the normal distance. Upon measurement of adults I found this distance to vary between 30 and 34 mm. with an average of 32 mm. To this point I shall call attention later.

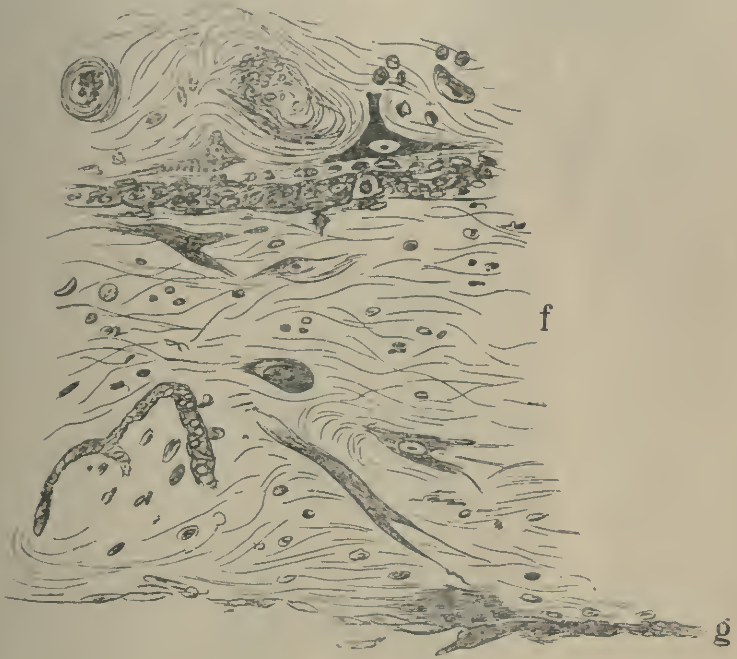
Microscopical examination of the hollow portion of the tumor shows the following layers in a section of its wall: (Fig. 5.)

FIG. 5.



The nasal surface shows, (*a*) a continuous layer of cylindrical epithelium with papillæ; (*b*) a thick, rather homogeneous layer of connective tissue half the thickness of the epithelial layer; (*c*) a thick layer of firm, fibrous tissue, with heavy connective tissue bundles densely interwoven, and rather sparsely provided with medium-sized vessels. This layer has the same structure as the periosteum and dura mater, and undoubtedly represents the continuation of these structures. (*d*) A layer of much finer connective tissue fibres, much more vascular than the previous layer, showing numerous larger and smaller vessels, corresponding to the outer layer of the pia mater. (*e*) A layer of fine, fibrillated connective tissue, with scattered small nucleated cells, and yet comparatively rich in vessels, corresponding to the deeper layer of the pia mater, and the beginning of the cortical substance of the brain (*f*) A layer of gray cortical brain substance, characterized by fine fibrillated neuroglia tissue, in which there were no large vessels, but subcapillaries and capillaries only, as is evident from their rectangular branching in this substance, shown by the higher power (Fig. 6). Numerous ganglion cells, partly small round cells, with large oval nuclei and distinct nucleoli, partly large multipolar ganglion cells with large cell-bodies, large oval nuclei and nucleoli, could be seen, and two or three branches or poles could be traced for a distance out into the surrounding tissue. No distinct anastomosis between any two cells could, however, be seen. (*g*) The cerebral wall of the sac is clad with a layer of flat endothelial cells, some of which, as seen in the figure, are loosened, and appear as free spindle-shaped cells with distinct nuclei.

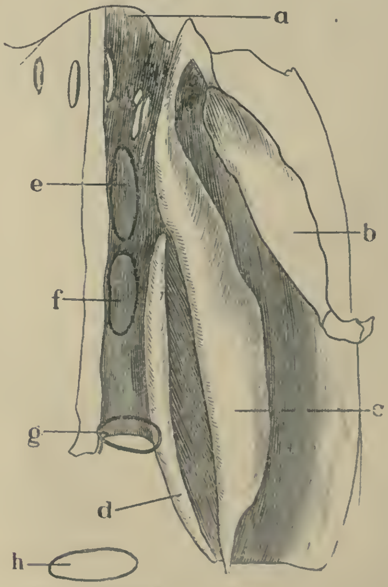
FIG. 6.



The microscopical examination shows distinctly that the tumor was a cysto-encephalocele, as we find under the covering membrane of the nose, first dura mater, then pia mater, then a layer of cortical brain substance surrounding a cavity clad with endothelium. Although no layer of white brain substance was present, there is no doubt that this cavity was a continuation of a ventricle, probably the third ventricle. Its regular shape, and the fact of its being entirely surrounded by a layer of cortical brain substance, makes it distinctly different from the serous cavities which we find in hernias of the brain as well as of the spinal cord, developed from, or an exaggeration of, the subarachnoid lymph-spaces.

It will probably always be difficult, if not impossible, to state at the outset whether a nasal polypus is or is not a hernia of the cerebrum. This is especially true in meningoceles and encephaloceles, in which the tumor is not compressible. In hydrencephaloceles the compressibility of the tumor, followed by return to its former size, as in my case, will lead us to suspect communication with the cranial cavity. Aspiration with the hypodermatic needle when the tumor is not compressed may bring out cerebro-spinal fluid and lead to a positive diagnosis. That this procedure was not successful in my case was due to the fact that the needle entered the peripheral solid portion of the tumor, and I believe that repeated attempts, through the nostrils, for instance, would eventually have resulted in the withdrawal of cerebro-spinal fluid.

FIG. 7.



PLACES OF EXIT FOR BASAL ENCEPHALOCELES. Ethmoid bone seen from below.

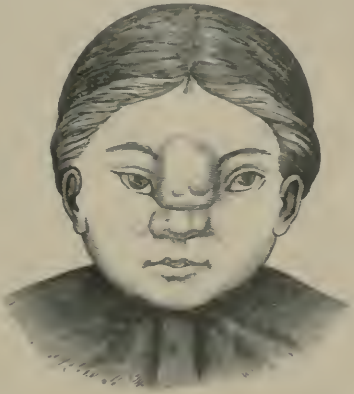
a. Cribriform plate. b. Unciform process. c. Inferior turbinated process. d. Superior turbinated process. e, f. Cases reported by Czerny, Serres, Spring, and Klimentowsky. g. Cases reported by Heinecke, Virchow, and Fenger. h. Case reported by Rippmann.

The location of the pedicle should also be considered; when it extends up toward the roof of the nose, in the region of the cribriform plate, we may suspect cerebral hernia, as this class of polypi is of necessity limited to this locality. Fig. 7 shows the points of exit of some of the recorded cerebral hernias.

As a point in diagnosis, my attention has been attracted to the distance between the eyes. It is possible that a basal cerebral hernia might cause a broadening of the root of the nose and a corresponding increase in the distance between the inner walls of the orbits, just as occurs in sincipital hernias. In my case the measurements show an increase in the inter-orbital distance of 1 cm., and this increase imparted to the face a certain expression which may be seen in the full-face photograph (Fig. 3).

As an analogue to this I have added a reproduction of a photograph of a case of cerebral hernia in the glabella, reported by Volkmann[18] (Fig. 8), in which it seems to me a similar expresion is present.

FIG. 8.



Bruns[2] depicts a cerebral hernia at the root of the nose in which an increased distance between the eyes is apparent. I merely call attention to this symptom as a possible help in diagnosis, the value of which future observations must decide.

There is very little difference between cerebro-spinal fluid (Hoppe-Seyler) and pure lymph (Hensen and Dähnhart). They contain respectively 98.7 and 98.6 per cent. of water, and 0.6 and 0.14 per cent. of albumin. There will probably be only slight difficulty in recognizing the cerebro-spinal fluid when it escapes through the nose, as any secretion, even the most watery, through the nasal mucous membrane, will contain some mucin, and will consequently be more or less viscid. Furthermore, it may be confidently expected to contain at least as much, if not more, albumin than is found in the hydropic exudates of the serous cavities, where the pericardial fluid, for instance, contains 2.46 per cent. of albumin, or fifteen times as much as is found in the cerebro-spinal fluid.

While we must admit the correctness in general of Heinecke's remark that most of the basal cerebral hernias possess no surgical interest, as they are found only in non-viable children, the case reported by Abraham, and my own case, show conclusively that patients with basal hernias may live to adult age, and my case demonstrates in addition that the development of the brain and mental faculties may be unimpaired, notwithstanding the cerebral hernia.

The treatment should be extirpation, even if the tumor is small and causes no other disturbance than that of a stationary nasal polypus; there will always be the danger of meningitis and death from accidental injury or surface inflammation. We would think, *à priori*, that the greatest danger would exist in case of hydrencephaloceles. A suppuration into the cavity would at once expose the entire ventricular system of the brain to infection, and it is well known that when an abscess opens into the lateral ventricle, death follows in a short time.

The surgical treatment is comparatively simple so far as the size of the pedicle is concerned, because it is always small, or narrow, seldom larger than a goose-quill, and, consequently, requires only simple ligature, which is best accomplished by transfixion.

The difficulty in operating lies in the inaccessibility of the pedicle at a point close to its exit from the cranium. The more posterior the point of exit, the greater the difficulty of the operation.

Various preparatory operations are required in the treatment of hernias whose pedicles are situated in different parts of the nose. Ligation and transfixion require much more operating space for manipulation than does simple division of the pedicle.

The anterior third of the nasal cavity can be reached, as in Czerny's case, by longitudinal division of one nostril, or by Ollier's method of temporary transverse osteoplastic resection of the nasal bones and septum at the root of the nose, or by Bruns' lateral osteoplastic resection of the nasal bones and septum.

If the pedicle is located in the anterior part of the middle third of the nose, Annandale's operation, which has already been mentioned, may give sufficient space for manipulation. If it is located in or just anterior to the posterior third of the nasal cavity, Von Langenbeck's resection of the superior maxilla, as practised in my case, will be required. If, however, the pedicle should be found to be located in or behind the posterior nares, I am of the opinion that nothing short of total extirpation of the superior maxilla will furnish the space necessary for operating, and it is a serious question whether a tumor in this location should be removed, when its extirpation would entail so great a sacrifice.

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THE SANITARY SUPERVISION OF TUBERCULOSIS AS PRACTISED BY THE NEW YORK CITY BOARD OF HEALTH.

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IN 1882 Koch published his classical paper on Tuberculosis, showing that it was an infectious and communicable disease caused by the tubercle bacillus. With the establishment of this proposition the disease would naturally have come under the immediate consideration of sanitary authorities, but time was needed to create a general belief in the truth of Koch's statements, and for this reason some years elapsed before action based on his observations was anywhere taken. Even in Berlin, which has been so long the centre of scientific medical research, and where Koch's work was published, no attempt has been made toward the sanitary surveillance of this disease. It is in New York City and within the last year that the most advanced and the only decided steps have been taken in the adoption of active measures designed to prevent the spread of tuberculosis.

The measures finally adopted were preceded by others intended to widely diffuse a knowledge of the character of the disease, to promote agreement among physicians as to the necessity of prophylactic measures and their nature, and to determine how soon a consensus of the best medical opinion would support radical action by the Health Department.

In 1889, at the instance of the Medical Commissioner of Health, Dr. J. D. Bryant, the Board passed a resolution calling on the consulting pathologists of the Department for a report on the causation and prevention of pulmonory tuberculosis. A report was prepared and forwarded, which recommended the adoption of certain measures designed to limit the spread of this disease. To test medical opinion in New York on this subject, Dr. Bryant addressed a letter to twenty-four of the most prominent and influential physicians of the city, asking for their opinion as to the necessity and advisability of action by the Board of Health looking to the sanitary surveillance of tuberculosis. Only five or six replies were received to these letters, and these would not justify action, with the exception of two, which advised interference on the part of the Board of Health. There were newspaper interviews with numerous prominent physicians at this time, and in all of these, with one exception, the opinion was expressed that no action was called for by the Health Department. The Health Board, therefore, determined to wait until the medical profession would offer more cordial support. A large number of leaflets, however, were printed and distributed, giving the essential known facts regarding the communicability of tuberculosis, and a campaign of education was begun. This action of the New York City Board of Health in 1889 is believed to have been the first movement officially taken by any municipal sanitary board toward the formal supervision of tuberculosis.

In the fall of 1893 the next movement was begun by the presentation to the Board of a report from Dr. H. M. Biggs, pathologist to the Health Department, calling attention anew to the sanitary importance of this disease. In this document specific recommendations were made, and emphasis was particularly laid on the following facts:

1. Tuberculosis is a communicable disease, and is distinctly preventable.
2. It is acquired by the direct transmission of the tubercle bacilli from the sick to the well, usually by means of the dried and pulverized sputum floating as dust in the air.
3. It can be largely prevented by simple and easily applied measures of cleanliness and disinfection.

The report concluded as follows:

> The time has arrived when the knowledge concerning the causation, extension, and prevention of pulmonary tuberculosis is sufficiently definite to make possible the adoption of important practical measures for its restriction; yet these measures must at present differ in many respects from the more summary proceedings justified in other more readily transmitted diseases, more properly called contagious; for it is to be remembered that while tuberculosis is always the result of infection, yet it is far less readily communicated than some contagious diseases, and, with proper precautions, victims of this disease may, without endangering others, pursue their usual avocations.
>
> I would therefore recommend:
>
> First. That there be systematically disseminated among the people, by means of circulars, publications, etc., the knowledge that every tubercular person may be a source of actual danger to his associates, and his own chances of recovery may be diminished, if the discharges from the lungs are not immediately destroyed or rendered harmless.
>
> Second. That all public institutions, such as asylums, homes, hospitals,

dispensaries, etc., be required to transmit to the Board of Health the names and addresses of all persons suffering from pulmonary tuberculosis, within seven days of the time when such persons first came under observation.

Third. That special inspectors be assigned to duty for the investigation of this disease, and whenever the Department has become aware of the existence of families or premises where tuberculosis exists, or has recently existed (as in case of death or removal), it shall be the duty of these inspectors to visit such premises, deliver proper circulars and give suitable information to the persons residing there, and take such specific measures of disinfection as are required in each case.

Fourth. That the Board urge upon hospital authorities the importance of separation, so far as possible in the hospitals of this city, of persons suffering from pulmonary tuberculosis from those affected with other diseases, and urge that proper wards be set apart for the treatment of this disease.

Fifth. That the Department of Charities and Correction of this city be requested to take such action as is necessary to provide a hospital, to be known as the "Consumptive Hospital," to be used for the exclusive treatment of this disease, and that, so far as practicable, all inmates of the various institutions under its care, suffering from tuberculosis, be transferred to this hospital.

Sixth. That the Health Department undertake the bacteriological examination of the sputum for diagnosis in every case of pulmonary disease of doubtful character in private dwellings, boarding-houses, or tenement-houses, where the physician in attendance desires that this should be done. This procedure to be carried out with a view of obtaining definite knowledge upon which the proper sanitary surveillance of those suffering from tuberculosis can be based.

Seventh. That all physicians practising their profession in this city be requested to notify this Board of all cases of pulmonary tuberculosis coming under their professional care.

For the proper performance of the preliminary work as detailed above, a special corps of medical inspectors should be provided, whose duties should be entirely confined to work connected with the investigation of tuberculosis and the carrying out of the means to be taken for its prevention.

Finally, in urging the adoption of the recommendations of this report, or some similar ones, I would add that there is, it seems to me, a widespread feeling among the medical profession and the laity that some sufficient means should be at once taken to prevent the great and unnecessary loss of human life caused by consumption, and that it is imperative that sanitary authorities adopt such measures as science has shown to be practicable and efficient in controlling the ravages of this disease.

It is my belief that the New York City Board of Health, which has so often achieved such notable success in the management and control of other contagious diseases, should take the lead in this matter and adopt measures to meet this new and urgent demand upon its resources.

This report with its recommendations practically in the form as stated, was adopted by the Board, December 13, 1893, on recommendation of the Medical Commissioner, Dr. Cyrus Edson, and on January 24, 1894, Dr. H. M. Biggs presented another communication including further recommendations designed for the efficient execution of the general plan. Of these latter the most important was the recommendation

That medical sanitary inspectors visit all premises which have been occupied by consumptive patients and vacated either by death or removal, and direct as to the removal of infected articles for disinfection by the Department, and forward written recommendations as to the cleansing and renovation of the premises. On the basis of these recommendations an order shall be issued by the Board on the owner of the premises, with directions as to their renovation, notifying him that the Board will not allow the premises to be occupied by any other persons than those living there at the time, until the order has been complied with. At the same time the following placard, with the name and address filled in, shall be furnished to a sanitary inspector to be posted upon the door of the apartment:

HEALTH DEPARTMENT,
No. 301 Mott Street, New York.

NOTICE.

Consumption is a communicable disease. This apartment has been occupied by a consumptive, and may have thus become infected. It must not be occupied by persons other than those now residing here until an order of the Board of Health, directing that it be cleansed and renovated, has been complied with.

Name of occupant
Floor No. Street.

This notice must not be removed until the order of the Board of Health has been complied with.

By order

The recommendations of the second report were adopted by the Health Board February 14, 1894, and circulars of information to physicians were ordered printed. Accordingly, the following circular was prepared and a copy sent to every physician having an office in New York City:

Circular of Information to Physicians regarding the Measures Adopted by the Board of Health for the Prevention of Tuberculosis in the City of New York.

HEALTH DEPARTMENT, No. 301 Mott Street,
NEW YORK, February 13, 1894.

The communicability of pulmonary tuberculosis has been so thoroughly established, and is now so generally recognized by the medical profession throughout the world, that the Board of Health of New York City has determined that the time has arrived when active steps should be taken looking toward its prevention in this city. The Board has therefore resolved to adopt the following preliminary measures:

1. The Department will hereafter register the name, address, sex, and age of every person suffering from tuberculosis in this city, so far as such information can be obtained, and respectfully requests that hereafter all physicians forward such information on the postal cards ordinarily employed for reporting cases of contagious disease. This information will be solely for the use of the Department, and in no case will visits be made to such persons by the inspectors of the Department, nor will the Department assume any sanitary surveillance of such patients, unless the person resides in a tenement house, boarding-house, or hotel, or unless the attending physician requests that an inspection of the premises be made; and in no case where the person resides in a tenement-house, boarding-house, or hotel, will any action be taken if the physician requests that no visits be made by inspectors, and is willing himself to deliver circulars of information, or furnish such equivalent information as is required to prevent the communication of the disease to others.

2. Where the Department obtains knowledge of the existence of cases of pulmonary tuberculosis residing in tenement-houses, boarding-houses, or hotels (unless the case has been reported by a physician, and he requests that no visits be made) inspectors will visit the premises and family, will leave circulars of information, and instruct the person suffering from tuberculosis and the family as to the measures which should be taken to guard against the spread of the disease, and, if it is considered necessary, will make such recommendations for the cleansing or renovation of the apartment as may be required to render it free from infectious matter.

3. In all cases where it comes to the knowledge of the Department that

premises which have been occupied by a tubercular patient have been vacated by death or removal, an inspector will visit the premises and direct the removal of infected articles, such as carpets, rugs, bedding, etc., for disinfection, and will make such written recommendations to the Board as to the cleansing and renovation of the apartment as may be required. An order embodying these recommendations will then be issued to the owner of the premises, and compliance with this order will be enforced. No other persons than those there residing at the time will be allowed to occupy such apartments until the order of the Board has been complied with. Infected articles, such as carpets, rugs, etc., will be removed by the Department, disinfected, and returned without charge to the owner.

4. For the prevention and treatment of pulmonary tuberculosis it becomes of vital importance that a positive diagnosis shall be made at the earliest possible moment, and that the value of bacteriological examinations of the sputa for this purpose may be at the service of physicians in all cases not under treatment in hospitals, the Department is prepared to make such bacteriological examinations for diagnosis, if samples of the sputa, freshly discharged, are furnished in clean, wide-necked, stoppered bottles, accompanied by the name, age, sex, and address of the patient, duration of the disease, and the name and address of the attending physician. Bottles for collecting such sputa, with blank forms to be filled in, can be obtained at any of the drug stores now used as stations for the distribution and collection of serum tubes for diphtheria cultures. After the sputum has been obtained, if the bottle, with the accompanying slip filled out, is left at any one of these stations, it will be collected by the Department, examined microscopically, and a report of the examination forwarded to the attending physician free of charge.

5. The authorities of all public institutions, such as hospitals, dispensaries, asylums, prisons, homes, etc., will be required to furnish to the Department the name, sex, age, occupation, and last address of every tubercular patient coming under observation within seven days of such time.

It is the earnest wish of the Board of Health that all practising physicians in this city co-operate with the board in an earnest and determined effort to restrict the ravages of this the most prevalent and formidable disease with which we have to deal.

By order of the Board of Health,

CHARLES G. WILSON, *President.*

EMMONS CLARK, *Secretary.*

In addition, the following circular of information for consumptives was prepared and printed in English, German, Hebrew, and Italian.

Information for Consumptives and Those Living with Them.

HEALTH DEPARTMENT, No. 301 Mott Street,
NEW YORK, February 13, 1894.

Consumption is a disease which can be taken from others, and is not simply caused by colds. A cold may make it easier to take the disease. It is usually caused by germs which enter the body with the air breathed. The matter which consumptives cough or spit up contains these germs in great numbers—frequently millions are discharged in a single day. This matter, spit upon the floor, wall, or elsewhere, is apt to dry, become pulverized, and float in the air as dust. The dust contains the germs, and thus they enter the body with the air breathed. The breath of a consumptive does not contain the germs and will not produce the disease. A well person catches the disease from a consumptive only by in some way taking in the matter coughed up by the consumptive.

Consumption can often be cured if its nature is recognized early and proper means are taken for its treatment. *In a majority of cases it is not a fatal disease.*

It is not dangerous for other persons to live with a consumptive, if the matter coughed up by the consumptive is at once destroyed. This matter should not be spit upon the floor, carpet, stove, wall, or street, or anywhere except into a cup kept for that purpose. The cup should contain water, so that the matter may not dry, and should be emptied into the closet at least twice a day and carefully washed with hot water. Great care should be taken by a consumptive that his hands, face, and clothing do not become soiled with the matter coughed up. If they do become soiled they should be at once washed with hot water and soap. When consumptives are away from home, the matter coughed up may be received on cloths, which should be at once burned on returning home. If handkerchiefs are used (worthless cloths which can be burned are far better) they should be boiled in water by themselves before being washed.

It is better for a consumptive to sleep alone, and his bed-clothing and personal clothing should be boiled and washed separately from the clothing belonging to other people.

Whenever a person is thought to be suffering from consumption, the name and address should be sent at once to the Health Department, on a postal card, with a statement of this fact. A medical inspector from the Health Department will then call and examine the person to see if he has consumption, providing he has no physician, and, if necessary, will give proper directions to prevent others from catching the disease.

Frequently a person suffering from consumption may not only do his usual work without giving the disease to others, but may also get well, if the matter coughed up is properly destroyed.

Rooms that have been occupied by consumptives should be thoroughly cleaned, scrubbed, whitewashed, painted, or papered before they are again occupied. Carpets, rugs, bedding, etc., from rooms which have been occupied by consumptives, should be disinfected. The Health Department should be notified, when they will be sent for, disinfected, and returned to the owner free of charge, or, if he so desires, they will be destroyed.

By order of the Board of Health,

CHARLES G. WILSON, *President.*

EMMONS CLARK, *Secretary.*

A supply of these circulars was sent to the hospitals and dispensaries throughout the city, with the request that a copy be given to every consumptive patient applying for relief, and, in addition, copies have been delivered generally by an inspector to all reported living cases of tuberculosis, except those under the care of private physicians.

A registry of reported cases was begun the first day of March, and from that date till the first of November, 3252 living cases had been reported to the Department. Notice was sent to all the hospitals, dispensaries, and other institutions in the city where cases of tuberculosis might be treated, informing them of the new requirements of the Health Department, and directing that reports of all cases be sent to the Department weekly, in accordance with the resolution of the Board.

The circular of information delivered to physicians asked for their co-operation, and requested that reports be sent of all cases that came under observation. The reports from private physicians were not made compulsory. From the two sources mentioned above, *i. e.*, institutions and private physicians, developed to their utmost, a nearly complete record of the cases of active tuberculosis living in any city might be obtained. It was not deemed wise, however, in the beginning, to make it obligatory for physicians to report cases, especially as it was comparatively easy to obtain reports from public institutions, which would give the most numerous class of patients and those whom it was most important to instruct.

A registry of the deaths due to tuberculosis was also begun March 1st, and this contained on November 1st, 3316 names. This registry is made up by the examination daily of the death certificates filed with the Department, and a record is made of all those in which tuberculosis in any form is assigned as the cause of death.

The records of living cases and of deaths are preserved in two card indices—one, a name index, arranged alphabetically, and the other a street index, arranged by streets and by the house number of each street. Dead cases are entered on blue cards and living cases on pink cards. In addition to the name and address, there are entered on the cards the age, sex, and occupation of the individual; in living cases also the institution from which reported and the date of report, and in dead cases the date of death. The registry finally is made more complete by platting all cases on a series of maps which cover the whole of Manhattan Island. There are one hundred and ten of these maps bound in atlas form. They were made under the direction of the Department, and each one, three by two feet in size, is drawn to a scale of one hundred feet to an inch. This scale is large enough to show every house-lot in the city by an area in which can be platted forty cases of tuberculosis. The maps are so arranged that they represent the sanitary districts of the United States census of 1890. These districts are supposed to contain a more or less homogeneous population. The entry of cases is made by conventional signs, which indicate the month and year of report, and whether the case is living or dead. It is believed that such a systematic study of the history of infected spots as can eventually be made from these maps will hardly fail to aid greatly in our knowledge of the methods of extension of tuberculosis and the measures required for its repression.

With certain exceptions, such as patients under the care of private physicians, all reported cases, living or dead, are assigned to the medical inspectors of tuberculosis for the district from which the cases are reported. The inspector visits the address given, and, if the patient is living, leaves a circular of information and gives verbal instruction to the friends about the danger of infection and the care of the sputum. If the address is that of a dead patient, or if the patient, though living, has moved, the inspector examines the premises and makes such recommendations as seem to him necessary to render the habitation free from danger of infection. These recommendations, made out on a prescribed form, usually advise the following routine treatment of apartments: Kalsomined or whitewashed walls or ceilings are washed with a solution of washing-soda (one-half pound to three gallons of hot water), and then kalsomined or whitewashed again; paper walls or ceilings are similarly washed and are repapered; the woodwork is scrubbed with the soda solution and repainted. The inspector's recommendations are forwarded to the Board, and on them as a basis a ten-day order is issued on the landlord, requiring him to carry out the specified renovation. The execution of the order is then (as with all orders of the Board) placed under the supervision of the Sanitary Police. The premises are re-inspected, and if at the expiration of ten days the owner has not complied with the order it is referred to the attorney of the Board for enforcement. This procedure was determined upon because of the difficulty of disinfection of apartments in which cases of tuberculosis have been, and the greater efficiency attained by the system of renovation. The Health Department, moreover, is relieved of much labor and expense. The method is easy of enforcement, as is shown by the fact that compliance with the order has not been refused in a single case. The chief point of interest in this plan is that renovation rather than disinfection is called for. Disinfection involves the use of materials and methods which are not universally familiar. The method of renovation required is understood by all, and is more efficient than any method of disinfection which could be employed; and, finally, disinfection often leaves the apartment in an undesirable condition, while renovation is, of course, always appreciated by the tenant. It is in line with this policy that soda solutions are advised for use instead of sublimate solutions. Soda is an efficient cleansing agent, and is familiarly known; is usually in the house, and is comparatively inexpensive; and, finally, will be used, and used in sufficient quantity, while more expensive and unfamiliar disinfectants would not be employed.

Not only the apartments, but the household goods should, of course, be freed from infection, and the attempt has been made to have goods, such as infected bedding, carpets, etc., disinfected at the city disinfecting station. This, however, has been only partially successful, for often a considerable interval has elapsed between the death of the patient and the visit of the inspector, and goods have often been washed, destroyed, or sent away to be cleaned. Still, when feasible, goods are removed by the Department and properly disinfected.

At the same time that the other measures were introduced, arrangements were made for the collection and examination of sputa for the diagnosis of suspected cases of tuberculosis. This measure was designed to give greater accuracy to the work of the Health Department in dealing with many cases and to enlist the co-operation of physicians by affording them assistance in the diagnosis of cases which otherwise would often be without their reach. It is in line with the previous work of the Department in making without charge bacteriological examinations for the diagnosis of diphtheria. In carrying out this measure, two-ounce jelly-jars with metallic screw tops fitted with rubber washers are supplied at forty or more apothecary shops, scattered at convenient points throughout the city. These places are already familiar as depots for the distribution of "culture outfits" for the examination of diphtheria. With the jars are delivered circulars containing the following directions as to the collection of sputa:

> Sputum should be collected only in clean, wide-mouthed, well-stoppered bottles, with a capacity of at least four ounces. Suitable bottles can be obtained at any of the depots for the distribution and collection of diphtheria culture tubes.
>
> Care should be taken that bronchial and not pharyngeal secretion is collected, and the expectoration discharged early in the morning is to be preferred. If the expectoration is scanty, the entire amount discharged in twenty-four hours should be collected.
>
> The data asked in the accompanying blank should be carefully filled out in every case.

The data asked for are the name, age, sex, address, and occupation of the patient, the name and address of the attending physician, the duration of the disease, and an answer to the question whether there have been previous cases of tuberculosis in the family. These are required for record in case the sputum contains tubercle bacilli, and examinations will not be made unless these data are forwarded with sputum. The jars containing the sputa, and the forms filled out, are returned to the depot and are daily collected by an employé of the Department. The sputum is examined bacteriologically in the laboratory and a report is sent to the attending physician the following day.

In the prosecution of the work as above outlined, certain difficulties have been encountered. These mainly relate to the obtaining of full registration of caes. As yet, private physicians do not generally report their cases of tuberculosis, although more and more cases are being constantly reported, and the data in a constantly increasing number of cases are being obtained through the sputa examinations. The reports from institutions, therefore, furnish the largest proportion of the cases recorded, and such reports are in some instances very inaccurate. Many cases escape detection on account of the inefficient examination given patients. Incipient tuberculosis is not usually diagnosticated in hospitals and dispensaries, and occasionally, perhaps, an erroneous diagnosis of tuberculosis is made. The addresses also given in many reports need revision. Patients frequently give their addresses wrongly through intention, and perhaps as frequently the clerk records the address incorrectly. Naturally, therefore, a great many false addresses reach the Department and are excluded from the record only by the search of the inspectors. Not infrequently, too, in death certificates, pneumonia and chronic bronchitis are given as the cause of death to conceal cases of tuberculosis. The importance of this factor is increased through the influence of the industrial insurance companies. It has been found that a large proportion, even of dispensary patients, carry a small life insurance, frequently just enough to pay funeral expenses, and if tuberculosis is ascribed as the cause of death, policies issued by many of the industrial insurance companies are wholly or in part vitiated. The number of persons who are interested that the word tuberculosis shall not appear on the death certificate may be inferred from the fact that investigation has shown that a single company carries nearly 400,000 policies in the metropolitan district, which corresponds pretty closely with the city of New York. Attempts to influence the statements on the death certificates are therefore common. Direct bribes are offered, and the remark, "Well, doctor, if I don't get the insurance I cannot pay your bill," may well be considered a forcible stimulus to some physicians to seek for other causes of death. An investigation is now being made of every case of death from diseases of the respiratory organs other than tuberculosis, to determine if the patient has been previously reported as suffering from tuberculosis, and in a number of instances, such previous reports have been found. The physician who has issued the death certificate is then called upon to explain the discrepancy.

The obvious results of the work done thus far lie in the evident effects in the education of the people as to the infectious nature of tuberculosis and the means to be taken for its prevention, and in the destruction of sources of infection by the renovation of infected apartments. It may be doubted whether any considerable degree of popular information as to the necessity of care for the sputum can be diffused through the non-English-speaking inhabitants of the poorest tenement-house districts, recruited as they continually are by fresh supplies of the most filthy and ignorant classes from all parts of Europe; but in the better class of tenements, where the inhabitants speak English, there has been already such a spread of knowledge concerning the nature of this disease that very frequently the inspectors now find at their first visits that all the precautions advised have been already taken. It is worthy of note, too, that while the number of apparent deaths from tuberculosis has been falling for several years, yet this year a much greater diminution has taken place than ever before.

Another perhaps not unimportant result of the work in New York City is the influence on the action of other sanitary authorities. Similar measures have been adopted at the instance of Dr. Cyrus Edson by the New York State Board of Health, and measures and circulars of the New York City Board have been adopted by sanitary authorities in many other cities, and by State Boards in other States. Still the work of restriction of tuberculosis even in New York has but just begun. Among the most pressing needs of the future are hospitals for the treatment of advanced cases, sanitaria outside of New York, preferably in the pines of

Long Island, for the care of incipient cases, inspection of factories, shops, and all other places where phthisical patients may be found, and enforcement of sanitary measures in these places, and in all places of public assembly and in the means of public conveyance.

THE OPERATIVE TREATMENT OF SPASMODIC TORTICOLLIS, WITH CASES.

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Medical treatment of this obstinate and distressing affection has proved, and continues to prove, so unsatisfactory that it seems not improbable that internal methods will be one day no more considered in the therapeutics of spasmodic torticollis than in that of writer's cramp, with which it is doubtless allied. Mechanical support to the head, again, has been found not only inefficacious, but unendurable, the restraint only adding to the discomfort and the tendency to spasm. This method will doubtless, therefore, be entirely abandoned also. We have massage, electricity, and operation left. The first has not been given as yet, perhaps, a sufficiently thorough trial to establish its exact place as a therapeutic agent in this affection, but the experience of the writers is encouraging enough to warrant advising the use of massage at least as a temporary resort, while awaiting the time for operation, in the hope that an occasional patient may be so far relieved that he will not require the more radical measure. In one of our cases (a comparatively recent one), in which operation was considered, Dr. Lindström gave massage, passive movements, and stretching with so decided benefit that the patient has returned to his work. It has been suggested that frequent stretching may do some good, by the plan sometimes tried (though not with specially satisfactory results) for locomotor ataxia and other spinal troubles. We can hardly venture to hope, however, for permanent improvement from any treatment of this kind except in recent cases.

Electricity has often been tried in this affection, most commonly in the form of galvanism to the affected and faradism to the opposing muscles. In certain instances improvement has appeared at first, but, as shown by Smith's *résumé* of cases—notably, those of Althaus, Poor, Knott, and Reynolds—this treatment has proved in the long run as little satisfactory as internal medication in the true spasmodic torticollis. We have tried systematic use of the galvanic current, both with and without faradism to the opposing muscles, especially in the case of Mrs. H., reported further on, without favorable result. A brief trial of static electricity was given, at Dr. Putnam's suggestion, upon another of these cases, with an apparent improvement only on the first application, after which its results were negative.

As an illustration of the therapeutic measures persistently but unsatisfactorily used for this affection we quote from a communication of Dr. John Goss regarding a certain patient: "The treatment has included alkalies, the iodides and bromides of potassium, colchicum, quinine, arsenic, valerianate of zinc, and cannabis indica, while various external remedies have been tried, such as iodine, sinapisms, atropine ointment, compound camphor liniment, and belladonna and aconite liniments, with chloroform. Due attention has been paid to diet, open-air exercises, and other hygienic measures, while the bowels have been carefully kept open; but the patient still remains *unrelieved.*" The case upon which these remarks were made was finally cured by resection of the spinal accessory and part of the posterior branches, performed by Dr. Noble Smith, who quotes the case.

As an illustration of the heroic yet unsuccessful use of drugs may be mentioned the exhibition in paralyzing doses of conium and gelsemium. The former was tried by Dr. John Harley up to two daily doses of four drachms each of succus conii, the spasm relaxing only during the toxicological effects.

In all the cases recorded by the writers the methods of treatment commonly advised have been tried successively, and in various combinations, without benefit worthy of record. We have also recommended relief of ocular defects without practical benefit, though *à priori* considerations would lead to a hope from this direction. We have now practically discontinued these efforts, and are in the habit of recommending massage only, combined with hygienic and other general measures, and whatever special treatment the case may demand, including ocular treatment when necessary, until the patient may become reconciled to operation.

Our experience has led us to endorse emphatically the dicta enunciated by Mr. Noble Smith in his excellent review of the subject up to 1891, from which we quote extensively. He states first that "neither drugs, local applications, nor other general methods are of any permanent use in the treatment of well-established spasmodic wry-neck." Secondly, that "electricity has failed to do any permanent good except in some recent cases which probably differed entirely in their nature from those referred to."

Search through reports of cases published since 1891 shows that further experimentation with other modes of treatment have added nothing to our resources in this direction. As examples may be mentioned cases of Allyrand (all medicines unavailing) and Guilbert (no improvement under medicines or electricity, antipyrine, baths, bromides, etc.).

Coming to the question of operation, nerve-stretching may be dismissed with passing notice. The report of only one case has come under our observation in which this method proved of more than temporary benefit. Among the published operations may be noticed those of Southam, Annandale, Smith, and one quoted by Bowlby. This procedure was attempted in Case IV. in our report—with moderate benefit, it is true. The successful case alluded to was that of Page. Too little hope can be offered by this operation, on the whole, to warrant subjecting the patient to the discomfort and inconvenience of undergoing two operations when the more radical one will be ultimately necessary, to say nothing of the loss of time and the prolonged suffering thereby entailed.

The operation of neurotomy need hardly be considered, as the most to be expected from simply dividing the nerve is the postponement of spasm during the few months required for the cut ends to unite.

We are brought, therefore, to the operation which alone offers hope of lasting benefit, namely, removing a considerable portion of the nerve or nerves supplying the affected muscles.

Since the initial operation (in 1866) by Campbell de Morgan (in which resection was resorted to in an obstinate case, after failure of drugs and local applications, only temporary improvement having followed neurotomy) neurectomy upon the spinal accessory nerve has been so often performed that the knowledge of this branch of the subject may be deemed almost exact. The operation on the posterior cervical branches has been less frequently performed, but, thanks to the efforts of such pioneers as Keen and Smith, we are rapidly becoming sufficiently familiar with this part of the subject to approach it with confidence. Among many operations on the spinal accessory nerve may be mentioned, for illustration, those of Campbell de Morgan, Sands, Tillaux, Hansen, Ballance, Annandale, Southam, Allÿrand, Gould, Noble Smith, Owen, Griffith and Halwell, and Hall.

Petit, in 1891, formulated twenty-six cases as follows: thirteen of success, seven of improvement, two of slight improvement, three of temporary benefit, and one of death from phlegmonous erysipelas.

The characteristic position of the head from affection of the spinal accessory is that of spasm of the sterno-cleido-mastoid, namely, the head bent forward, the chin turned to the opposite side and elevated. The illustration of Case III. (Fig. 1) gives a typical picture. If the trapezius is also affected, the position is the same, but the head is drawn more backward and sidewise. This tendency to rotation may be overcome, it would appear, by implication of the posterior rotators *on the same side.* Smith describes two such cases at length, in which the head was bent in the same direction in which it was rotated, both anterior and posterior muscles being affected on the same side. As a rule, however, it would appear from our own experience and from reported cases, that *the posterior rotators are generally affected on the opposite side, tending to assist, therefore, rather than to counteract the action of the sterno-cleido-mastoid as regards rotation.*

The technique of the operation on the spinal accessory calls for no comment here. The method preferred by the writers appears in the description of the cases following, operated on by Dr. Richardson.

Mr. Smith states that resection of the spinal accessory not only effects relief of the spasm of muscles supplied by this nerve, but is likely to remove spasm set up in other muscles, although other nerves are apparently involved. Our experience hardly lends strength to this hope (see Cases II. and IV.). We should not proffer this expectation with any confidence, but rather warn the patient that other muscles not apparently affected may in time succumb to the disorder and require further operation.

To the statements of the writer already quoted, that when other muscles remain affected the spasm may be removed by section of the nerves supplying those muscles, we are glad to subscribe from reports of cases, though we have had as yet no opportunity of personally verifying the fact. We have, however, advised further operation in several cases, and expect to be able at a future date to report the results of such interference.

This brings us to the question of operating upon the posterior cervical nerve-roots. The muscles of the posterior group may be divided roughly into those which draw the head back, those which rotate, and those (the larger number) which do both. Following the classification of Ballance, in the second group are placed the inferior oblique and rectus capitis posticus major. These are supplied by the sub-occipital nerve. Those which extend, namely, the rectus capitis minor, superior oblique, and complexus, are supplied by the same nerve. The larger muscles which when both sides are acting extend, and when one side is acting rotate, include the splenius, trachelo-mastoid, and complexus. The splenius, trachelo-mastoid, and the complexus are supplied by the succeeding posterior primary divisions of the cervical nerves. All the rotators here considered turn the face toward the affected side, as opposed to the muscles supplied by the spinal accessory, which turn the face away from it.

The posterior muscles appear to be more powerful than the anterior group. This is shown as regards rotation by the two cases mentioned by Smith, quoted above, and as regards extension by several of our cases. In these instances the head was drawn backward rather than forward, though the sterno-mastoid was apparently equally affected; all united to rotate, however, in the same direction.

The operation on the posterior branches has been performed times enough to remove the doubt, which naturally presented itself, whether the patient would be able to maintain the upright posture of the head after so extensive a paralysis.

The first case operated on by Smith was one involving the spinal accessory on the left and the posterior nerve-roots on the right, the head being rotated, therefore, to the right. Stretching was first performed on the left spinal accessory, followed at the end of six weeks by excision of the same nerve. About a month later the posterior branches were excised (through a longitudinal incision) on the right, from the second to the fourth inclusive, the sub-occipital being spared. This patient was seen a year after the operation, and remained quite well.

Keen published in January, 1891, a case illustrating his method of operating on these branches, using the transverse incision as a result of repeated experiment on the cadaver. His idea was to resect the first three branches supplying the principal posterior rotators—namely, the splenius capitis, the rectus capitis posticus major, and the obliquus inferior. Amelioration of the condition resulted.

Powers reports operation on a case involving the right posterior rotators without implication of the spinal accessory group. He describes the operation as intended to paralyze the three rotators (inferior oblique, rectus capitis posticus major, and splenius capitis, the former supplied by the first and second cervical, the second by the sub-occipital, and the third by the second and third cervical). He chose the transverse incision of Keen. The patient, seen one year later, showed a shortening of the splenius, and a tonic spasm in the right trapezius and levator anguli scapulæ. Rotation was easy when the head was extended; difficult when it was flexed (this movement being apparently antagonized by the muscles on the right). A month later the patient was much better and able to work; all movements were free.

Gardner and Giles report two cases treated by partial resection of both spinal accessory nerves and subsequent operations upon the posterior branches of the second and third cervical nerves. In one case perfect recovery followed, the patient being seen five years afterward; in the other, slight spasm in the posterior rotators on the left persisted, which it was expected would be relieved by another operation. Gardner claims precedence over Keen in this operation.

These writers advise allowing a considerable period to elapse after the operation on the spinal accessory, partly in the hope that the whole trouble will be thereby relieved, and partly to enable more exact study of the muscles involved, after paralysis of the trapezius. They advise operating on both spinal accessory nerves at one time, but separating the posterior operation into two parts.

Detailed description of the operation by transverse and longitudinal incision will be found, the former in the articles of Keen and Powers already quoted, and the latter in Smith's monograph. Smith prefers the longitudinal incision, while Powers advises the longitudinal incision for thin, the transverse for stout people.

With regard to the sex, time of life, and side affected, search through reported cases, as far as made by the writers, shows no preponderance of one sex over the other. The face was rotated to the right in more cases than to the left, but the difference was not sufficiently marked to establish the greater tendency. A rather striking fact regarding age was shown by an analysis of thirty-two cases taken consecutively, fifteen occurring between the ages of thirty and forty, as against six between twenty and thirty; three each between forty and fifty, and fifty and sixty; two between ten and twenty; two being described, one as middle-aged and one as of mature age; the age of one case is not stated.

The best incision for exposing the spinal accessory nerve seems to us to be along the anterior border of the sterno-cleido-mastoid muscle, where the nerve, passing obliquely downward and backward from the jugular foramen, is crossed by the fibres of the muscle. This point will be found about an inch and a half below the mastoid process, as we have demonstrated by numerous dissections. The centre of this incision, which need not be over an inch and a half in length, should be, therefore, an inch and a half from the tip of the mastoid process. After crossing the internal jugular vein the nerve lies upon the pre-cervical muscles and fascia. It is usually found with ease by careful dissection just above and internal to the point where it passes behind the muscle.

This nerve varies considerably in size and strength. It sometimes fails to follow the usual course. In one instance, in a dissecting-room subject, the spinal accessory came from the anterior divisions of the second and third cervical nerves; it was impossible to demonstrate the position of the nerve in this subject without extensive dissection of the deep parts. Had this very unusual variation existed in the cases operated upon, the search would have been unsuccessful. A similar anomaly was probably present in the case reported by Dandridge, and accounts for the failure of the procedure (*Trans. Amer. Surg. Assoc.*, 1880, p. 500).

As soon as the dissection, carried directly backward toward the prevertebral space, exposes the fascia covering the rectus capitis anticus major, the nerve usually is seen, especially if the dissection has been bloodless. A dry and bloodless field seems a sufficient advantage to justify great care in controlling hemorrhage as the operation proceeds, for with everything stained with blood it may be extremely difficult to find this nerve even within the narrow limits of its normal position.

We have at times found the exact position of the nerve by irritating it with the nail of the index finger—drawing the nail firmly across the bottom of the dissection at right angles with the nerve, and at the same time pressing firmly backward against the cervical bodies. In this manner the filaments are irritated enough to cause a sharp contraction of the sterno-mastoid and trapezius muscles. This procedure is so useful in case there is any difficulty in finding the nerve that we recommend it strongly. Instead of the nail, the handle of a scalpel or the blunt points of scissors may be used.

The nerve having been distinctly isolated, it should be drawn out of the wound as far as possible and cut. Both extremities may be stretched enough to allow the removal of at least two inches of nerve tissue, or the main trunk may be grasped with forceps and avulsed in both directions. We have never torn out the spinal accessory in this manner, however, on account of the danger of injury to the structures in the jugular foramen and at the base of the brain. From numerous experiments upon the cadaver we have found that the main divisions of the trifacial can be avulsed with little or no danger of injury to any intracranial structures.

After division of the nerve the sterno-mastoid becomes at once flaccid; the head can be brought easily into normal position, and if necessary, kept there. In one or two instances we have fixed the head for some days after dividing the nerve. Little is accomplished by this treatment, however, and its discomforts are so great that we no longer recommend it.

Case I.—Mr. S. P. H., aged fifty-five years, October 15, 1890. This gentleman, robust and of good family history, twenty-three years ago was troubled by a drawing of the head to the right. Dr. S. Cabot thought this was due to writing. Complete rest was followed by recovery. For years there was no further trouble, though there was a sense of uneasiness in the right sterno-mastoid muscle. Four or five years ago he began to have a disagreeable drawing feeling in the neck. This symptom was not excessive, being controlled sufficiently by local applications and by rubbing. About a year ago, however, the trouble began to grow worse, to affect him when lying down, and to be spasmodic in character. At this time the patient described the affection as a drawing of the head to the left, with considerable pain in the opposite side. The pain he referred to the spasm of the muscle. Dr. Irish, of Lowell, referred him to Dr. Walton, who advised first bromides and massage. This treatment proved ineffectual. The symptoms grew insupportable, the sleep was disturbed, and without hypnotics impossible.

There was a marked contraction of the right sterno-mastoid muscle, by which the head was strongly rotated to the left; at the same time the head was slightly retracted by contraction of the posterior flexors of the occiput. There was partial voluntary control over this muscular act, but the head would immediately resume this position on the slightest relaxation of these strong efforts of will.

The general condition of this patient was poor, owing partly to the constant distress in the daytime, and to painful spasms when in the recumbent posture, with inability to sleep. The face was pale and somewhat waxy; the expression was weary and anxious.

After careful observation for some days we decided to try without further delay resection and avulsion of the spinal accessory nerve. This operation was performed through an incision one and a half inches in length, on October 20, 1890. The nerve was isolated without difficulty, drawn out as far as possible, and divided. About an inch and a half of the nerve was destroyed in this manner. The muscle was paralyzed at once, the spasm immediately ceased, and for the first time in many months the patient was able to sleep in comfort. He was discharged on October 31, the wound having united firmly by first intention.

The condition was relieved for about a year, when the spasm began to recur in the same locality. In February, 1892, a year and a half after the operation, he was as bad as ever. Complete rest in the hospital afforded temporary relief only, and a second operation on the same nerve was deemed advisable. This was performed on April 20, 1892.

An incision was made along the anterior border of the sterno cleidomastoid muscle three or four inches in length. The nerve was found at the bottom of the wound, but only with great difficulty. In searching for the filaments in the scar tissue of the previous operation the sternomastoid muscle was very extensively cut, so that practically the operation of neurectomy was supplemented by that of muscle division. The difficulties in the performance of this operation were very great. The isolation and destruction of the nerve were deemed at the time unsatisfactory, owing to the impossibility of recognizing beyond a doubt the nerve tissue. The result, however, was brilliant, demonstrating most satisfactorily the success of the procedure, for there was immediate and permanent cessation of spasm.

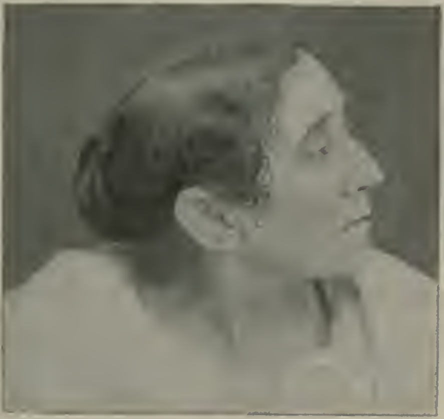
Relief has been continuous up to the present, no spasm appearing either in the muscles supplied by the spinal accessory nerve or in others.

Case II.—Mrs. T., aged forty-five years, a patient of Dr. Townsend, of Natick, was referred to Dr. Richardson by Dr. Folsom for a spasmodic torticollis that had for many months proved intractable to all palliative measures. The right spinal accessory nerve was resected, with immediate benefit. On August 10, 1894, Dr. Townsend writes: "The operation was a perfect success, and she has had little or no treatment since. A slight and temporary impairment of power in the corresponding arm was the only symptom left after her return home.

Case III.—A woman of middle age. Typical spasm in right sternocleido-mastoid, as shown in photograph (Fig. 1). Resection of spinal accessory. Complete and permanent relief to date. Absolute relief for a time, with reported recurrence of less distressing symptoms later. (Posterior rotators?)

Case IV.—J. D., aged twenty-eight years, entered the Carney Hospital, under the care of Dr. W. N. Bullard, on April 10, 1886, with a history of spasmodic twitching of the neck of eight months' standing. This began by a slight twitching at intervals of a week or two. From April until August the patient was treated without benefit by means of an immovable headgear. Large doses of quinine, salicylate of soda, and iodide of potash, were used without success. On August 3d, through an incision four inches in length along the anterior border of the sternomastoid muscle, the nerve was isolated and stretched, and a tension of ten pounds put upon it. The twitchings entirely disappeared, and the muscle remained perfectly quiet for two months. Soon after the operation the left sterno-mastoid began to twitch. On October 11th examination showed that there was still rapid contraction of the right sterno-mastoid muscle, though much less than before the operation.

FIG. 1.



Spasmodic torticollis relieved by operation. Typical case of involvement of sterno-cleido-mastoid.

The patient gradually improved, and was able to work about the wards of the hospital, where he remained several years. Dr. Ballard writes that improvement was permanent, though movements persisted.

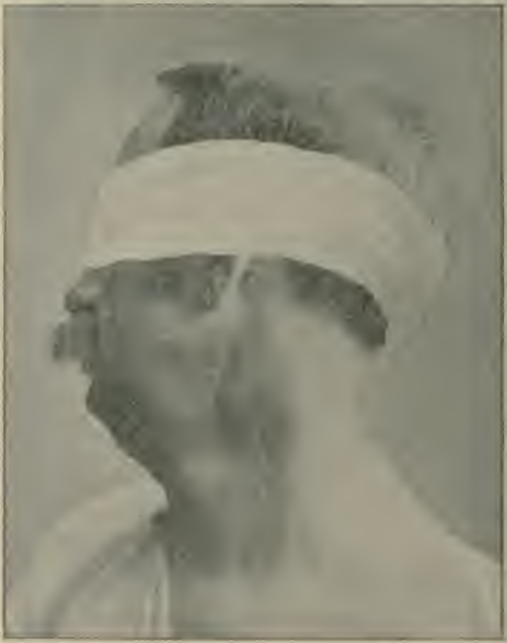
CASE V.—Mrs. M. J. H., aged sixty-seven years, entered the Massachusetts General Hospital on October 3, 1892. Ten years before she had neuralgia of head and face. Five years ago she began to carry the head to the left. On entrance to the hospital there was spasm of the right sterno-mastoid muscle. The trapezius was not affected. On October 8, 1892, under ether, the nerve was exposed through an inch incision in front of the sterno-mastoid muscle. Two inches of the nerve were removed. Ten days later, after firm union of the wound, some tendency was observed for the head to turn to the left. She was discharged on October 21st.

The following case shows that other muscles may become implicated after resection of the spinal accessory nerve, even though the spasm is practically limited to the muscles supplied by this nerve.

CASE VI.—W. B. A., aged forty-four years, blacksmith, married; had influenza in February, 1872. In March he strained his neck. In April he noticed wry-neck. No spasm was present at first; the spasms now draw the chin to the right. Dr. Richardson resected left spinal acessory nerve on July 7, 1892; relief was only temporary. He can bring the head and eyes to the front and even to the left, but this causes spasms. There is no strabismus. The pupils are equal. He decided against further operation August 25, 1892. September 7, 1892, he was no better and no worse, except that the head was drawn backward.

Fig. 2 shows the position of the head some time after operation. The scar of operation is visible. It will be seen that no spasm is present in the sterno-cleido-mastoid, which was completely paralyzed by the resection. The head is, however, still rotated to the right, but, instead of being drawn forward is now drawn forcibly backward, showing that the posterior rotators on the right have become involved. In the back view (Fig. 3) these muscles are seen to stand out prominently. It would seem now advisable to perform an operation on the posterior cervical branches on the right—an operation which we may fairly hope will complete the cure, although it cannot, of course, be absolutely promised that other regions will not become invaded.

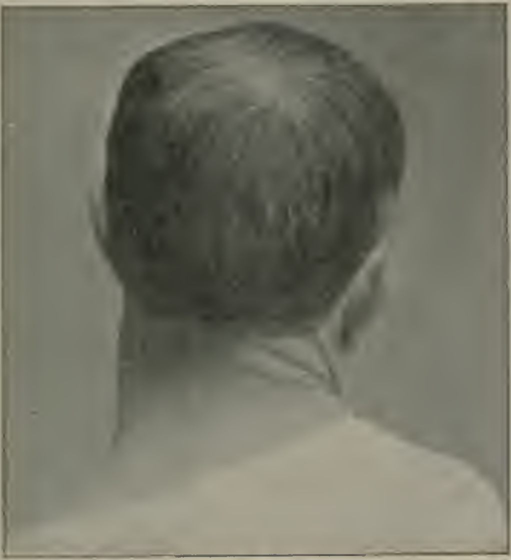
FIG. 2.



W. B. A. after operation.

CASE VII.—Mrs. H., a woman in middle life, of a decidedly neurotic temperament, was first seen in August, 1889. She was well up to three years ago, when she had an attack of pneumonia, with protracted convalescence, after which she was subject to colds. She had an attack two years ago of what was termed diphtheria, though she was in bed only one day. Soon after this she complained of weakness and prickly sensations in the arms and legs—symptoms from which she had also suffered after the pneumonia and after childbirth. She has suffered much from pain in the back for many years. She has had two children, the youngest is now eighteen. Physical examination shows typical spasm of the left sterno-cleido-mastoid and trapezius muscles, the head being turned constantly to the right, the patient using the hand to counteract the tendency. The eyes were examined by Dr. Bradford, who prescribed glasses for the error of refraction, without the least amelioration of the spasm. Electricity was faithfully tried, galvanism being used to the affected and faradism to the opposing muscles, without benefit.

FIG. 3.



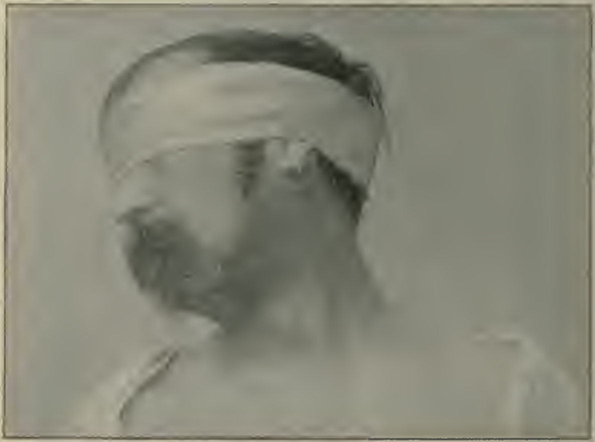
W. B. A. after operation.

Operation was performed on December 15, 1889. The nerve was found by means of the anterior incision. It was drawn out of the wound, and as long a piece excised as was practicable. Immediate correction of the spasm followed; the wound healed by first intention.

Spasms recurred for some time after the operation in the affected sterno-cleido-mastoid. These, however, ceased, and it was hoped that recovery would ensue; but rotation of the head to the left became more and more marked and troublesome, and has persisted up to the present time, with temporary remissions. The patient when last heard from was comparatively comfortable, and great hopes were entertained that the trouble was disappearing.

CASE VIII.—Male (referred by Dr. Hooker, of Springfield), a man aged forty-six years. Father died at eighty-eight of old age, though he is said to have had paralysis. His mother is said to have been of nervous temperament, but died of cancer at the age of seventy-four. One of his children has suffered from chorea. The patient himself was never robust. He is of nervous temperament, but had no special trouble until two years ago, when the spasms appeared. The movements came on gradually, growing steadily worse—rapidly so during the past few months. He is foreman in a printing establishment, but has not set type for ten years. When he did so it was not necessary for him to hold the head in any special position. There have been no symptoms of lead poisoning, but there is a blue line upon the gums. Astigmatism is present in the left eye. Vision in the right eye is wanting through congenital defect. The illustration (Fig. 4) shows the head rotated to the right and bent rather backward than forward. The left sterno-cleido-mastoid is tense, as well as the rotators at the back of the neck on the right, the case furnishing an excellent illustration of the common association of spinal accessory spasm on one side with spasm of the posterior rotators on the other. A course of iodide of potassium was advised and carried out by Dr. Hooker, without result. Operation was then decided upon and preparations made, the plan being either to operate first upon the left spinal accessory and afterward upon the posterior rotators, or to operate upon both at the same time, as might seem advisable. At the last moment, the patient, having been advised by another physician to undertake a course of treatment, decided to postpone the operation until this attempt had been made.

FIG 4.



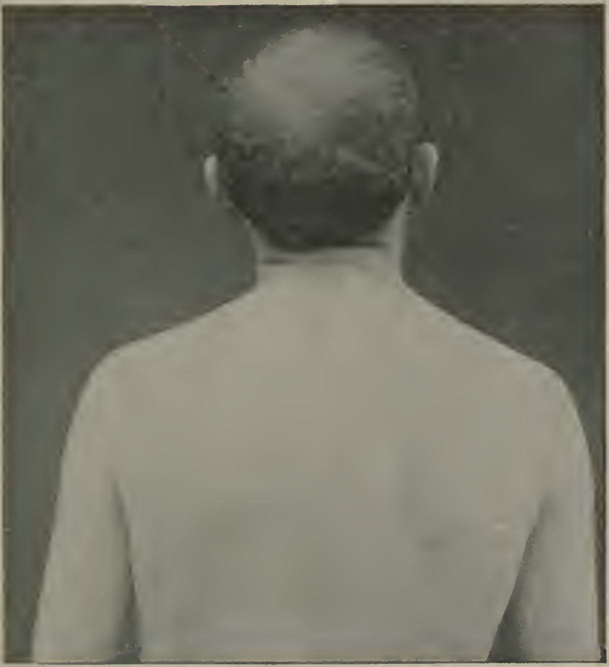
We have lately heard that the head is now drawn directly backward, probably due to implication of posterior muscles on the other side. This would doubtless have occurred if operation had been performed, and illustrates the importance of guarded prognosis.

CASE IX.—This case illustrates a different condition from any of the preceding in that the posterior muscles of the neck are affected on both sides. It is also important as showing the benefit of systematic massage and stretching, at least in recent cases.

The patient, a clerk, referred by Dr. Sherman, of Newton, was first seen in September, 1893. He had been well with the exception of a short attack of malarial fever two years ago. Within the past two weeks his head has been drawn involuntarily backward and somewhat rotated to the left. He has been obliged to give up work. The movements are not present while he is lying down, but are increased on attempts to work or walk. Tincture of gelsemium has been thoroughly tried, beginning with five drops every four hours and increasing to twenty-five. He is now taking ten drops. At the onset of the trouble he was given one-sixth of a grain of sulphate of morphine every four hours, for four doses; and quinine, two grains every two hours.

He has been kept in bed. No marked change has appeared since the onset. There are tender spots in the middle of the back and on the neck and at the mastoid insertion of the sterno-cleido-mastoid on the right. Has slept poorly. To relieve this condition, seven and a half grains of chloral have been given at night. He has been at his present work for ten years. The position of the head is not constant, being drawn sometimes directly backward, the chin elevated, the face being sometimes rotated to the right, at which times the left sterno-cleido-mastoid is prominent. The photograph (Fig. 5) shows the head drawn almost directly backward. Massage and stretching were undertaken by Dr. Lindström, and continued for seven weeks—three times a week, at the end of which time the head was held naturally and the patient was able to return to his work. While the result of this case would lead us to advise massage in preference to internal medication, or electricity, the case was so comparatively recent that it hardly subverts the dictum of Smith, that treatment other than operative is ineffectual in *well-established* cases of spasmodic torticollis, under which category this case would hardly come.

Fig. 5.



Spasm of the posterior muscles ot both sides, relieved by massage (comparatively recent case)

Case X.—Mrs. M. A. R., aged forty-eight years, entered the Massachusetts General Hospital on October 17, 1887. She had suffered from contraction of the right sterno-mastoid and trapezius muscles for four years. The head was drawn to the right and slightly rotated. She had been under the care of Dr. Putnam, who had used many remedies without effect, including electricity and immobilizing apparatus. The right sterno-mastoid was rigid and permanently contracted. When fully relaxed the head could be brought to an erect position, but no further than that. She could hold the head erect herself, but on relaxing her efforts it would be drawn toward the right shoulder and rotate toward the left.

On October 28th, the nerve was found and excised through an incision one inch in length, made along the anterior border of the right sterno-mastoid muscle, which became immediately soft and flexible. The head could be carried erect, and there was no pain.

A few weeks later she re-entered the hospital to have the right trapezius divided. The anterior fibres of that muscle were found somewhat contracted, and it was impossible to bring the head to more than an erect position on account of the shortening of these fibres. The trapezius and the sterno-mastoid muscle were very much relaxed, and the spasmodic contraction had ceased. In addition to the contraction of the anterior fibres of the trapezius, the scalenius medius was also shortened. No operation was performed upon these muscles, and the patient was discharged.

On October 29, 1894, Dr. Putnam writes: "I remember Mrs. R. well, and have seen her several times since the operation. There was some improvement, but the posterior muscles became more strongly affected than they had been before. Her general health became very poor also. I think she always considered that the operation had been of some benefit, but not so much so that her friends were willing that she should undergo another, as I suggested to her."

Case XI.—This case (just operated upon) offers so typical an illustration of the more common form of spasmodic torticollis that it is inserted to show our present manner of dealing with these cases, though it is too early to record the result.

The patient, a woman of middle age, referred to us by Dr. Ely, of Providence, has suffered from steadily increasing spasm for about seven months. Nothing unusual is discoverable in her habits, manner of life, heredity, or previous history. When seen one month ago the head was almost constantly rotated to the left, and somewhat retracted, the right sterno-cleido-mastoid stood out distinctly, and the posterior rotators on the left were somewhat hard. She had already been informed by Dr. Ely that operation would be the probable outcome, but it was recommended to try first massage for a month or two. At the end of a month the spasm had so far increased, and was so troublesome, that the patient herself desired immediate operation.

The nerve was removed on November 14, 1894, through an incision a little over an inch long, made not exactly parallel with the anterior fibres of the sterno-cleido-mastoid, but at a slight angle, in order to bring the scar in the line of a well-marked wrinkle, to avoid deformity. The dissection was carried down in the usual manner, until, with the finger, the bodies of the vertebræ could be felt. Across this space the nerve was felt as a tense cord—a very unusual condition in our experience. In previous operations the nerve has been relaxed at the bottom of the wound, and its situation has at times been determined only by irritating it with the nail, as described above. In this instance the cord could be felt very plainly, and the slightest digital pressure caused spasmodic contractions of both trapezius and sterno-mastoid. The nerve was drawn out of the wound and cut as high up as possible. The distal end was twisted out on the hæmostatic forceps. The whole portion removed in a state of laxity measured two and a half inches. The operation lasted twelve minutes, and was practically bloodless.

It is hoped that complete recovery will follow; if, however, the head is still rotated and retracted at the end of a month, the first posterior branches of the cervical nerves will be resected.

The description of other cases in which operation has been either declined or postponed is omitted.

Conclusions.—1. Palliative treatment, whether by drugs, apparatus, or electricity, will rarely prove successful in well-established spasmodic torticollis.

2. Massage may prove of value in comparatively recent cases.

3. Resection affords practically the only rational remedy.

4. Operation on the spinal accessory nerve may afford relief, even if other muscles than the sterno-cleido-mastoid are affected; on the other hand, the affection previously limited to the sterno-cleido-mastoid may spread to other muscles in spite of this operation.

5. No fear of disabling paralysis need deter us from recommending operation, as the head can be held erect even after the most extensive resection.

6. The most common combination of spasm is that involving the sterno-mastoid on one side and the posterior rotators on the other, the head being held in the position of sterno-mastoid spasm with the addition of retraction through the greater power of the posterior rotators.

7. It seems advisable in most cases to give preference to the resection of the spinal accessory as the preliminary procedure.

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THE TECHNIQUE OF VAGINAL HYSTERECTOMY.

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There is a growing tendency among gynecologists at the present time to attack by way of the vagina pathological conditions of the female pelvic organs formerly approached by cœliotomy. The chief arguments advanced in favor of the new departure are: the lesser shock of the vaginal operation, the absence of an abdominal cicatrix, and the avoidance of a possible hernia. The principal disadvantages of the vaginal operation lie in uncertainties of diagnosis previous to operation and in the greater difficulties of the operation itself. The uncertainties of diagnosis we can scarcely hope ever to entirely overcome. In many, though not in all, cases of uncertainty of diagnosis prior to operation, the diagnosis may be made after incision of the pouch of Douglas with practically equal facility as after opening the abdomen above the pubis. The technical difficulties of the vaginal operation will probably become less as the operation is more frequently practised and as we become more familiar with one or the other or all of the various techniques.

Those who now perform cœliotomies for various purposes so successfully have attained their present expertness in the school of experience. Just so it is and will be with vaginal hysterectomy. By the vaginal operation, as the term is here used, is not meant simple incision or puncture, with or without drainage, or aspiration of pathological accumulations in the pelvis. The term is applied in bringing the vaginal operation in competition with the suprapubic operation in the performance of oöphorectomy, salpingectomy, and hysterectomy, singly or in any given combination.

This paper deals with the technique of vaginal hysterectomy with and without added salpingectomy, oöphorectomy, or salpingo-oöphorectomy. Vaginal hysterectomy will first be considered by itself, to be followed by a few remarks upon the added procedures.

The methods of vaginal hysterectomy are three in number:

1. Serial ligation of the broad ligaments.
2. The clamp operation.
3. Enucleation, with ligation of bleeding vessels only.

Each of the three methods may be performed with or without morcellement. The general rule should be to remove the uterus entire, whenever its size permits of its delivery as a whole, through the vagina. Morcellement under these circumstances, except in cases of malignnt disease of the cervix, is to be considered an inferior procedure; it comes into play only in cases in which the uterus is too large to be delivered in one piece through the vagina. The writer has had occasion to remove the uterus through the vagina for probably every indication on which the operation has been done, and has had personal experience with each of the various methods of vaginal hysterectomy.

The following descriptions of the various methods is based upon this personal experience: Vaginal hysterectomy by whatever method, and for whatever purpose, is best practised with the patient in the lithotomy position. The vagina must, of course, first be cleansed and disinfected as thoroughly as possible. The writer employs for this purpose scrubbing with mollin containing 10 per cent. of creolin, followed by sublimate douches. A perineal retractor is next inserted. The writer makes use of the speculum bearing his name. The metal-weighted speculum of the French school and Simon's speculum answer the purpose equally well. The latter has the disadvantage of requring an assistant to hold it. Lateral retractors are a necessity; the anterior retractor I have thus far always been able to dispense with. An electric forehead-light will be found very useful in illuminating the depths of the pelvis. Until the peritoneum is opened irrigation is used to remove blood and débris and keep clear the operative field. After the peritoneum is opened, mopping with sterilized gauze, either in the form of serviettes or sponges, is employed. If the cavity of the uterus is known or suspected to contain pathogenic germs the cervix is dilated and the uterine cavity thoroughly washed with a strong (1:2000) sublimate solution. It is then packed with antiseptic, iodoform or sublimate, gauze.

Cases of malignant disease of the cervix which have progressed to ulceration require circumcision and removal of the entire broken-down mass, after which the instruments thus far used are discarded. The vagina is again washed, disinfected, and the hysterectomy completed with safely sterilized instruments and redisinfected hands. After asepsis of the vagina and uterus have thus been secured, the first step in the operation, except in cases in which the uterus is removed for malignant disease, should consist of an exploratory incision of Douglas' sac. This incision is made for the purpose of either establishing or confirming the diagnosis. It is only dispensed with in cases in which Douglas' sac is so obliterated by adhesions that the latter cannot be safely separated in their entirety at this stage of the procedure. The next step of the operation, by whatever method attempted, is circumcision of the cervix. Except in cases of malignant disease this circumcision should be made as near as practicable to the lower end of the cervix. Hemorrhage from the vaginal arteries is thus reduced to a minimum. The circumscribing incision must be carried low enough, at least, to avoid the bladder anteriorly. Posteriorly it should be continuous with the incision into Douglas' sac. The incision is carried clean through the mucous membrane into the submucous connective tissue. Up to this point the procedures already described are common to all the various methods of vaginal hysterectomy. From this stage on each method requires separate description.

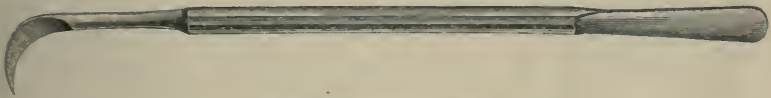
1. *Serial ligation of the broad ligaments.* After separating the cervix from its surroundings for a short distance, so as to allow the tissues to retract somewhat, the bladder is dissected, bluntly or with scissors, from the anterior surface of the uterus until the vesico-uterine pouch is reached. In separating the bladder, always hug closely the anterior surface of the uterus. If it can be easily done at this stage the anterior peritoneal pouch is opened and the opening enlarged laterally by tearing. Ligation of the base of the broad ligaments, including the uterine arteries, is the next step. To insure inclusion of the entire arterial supply the armed ligature-carrier is best carried into Douglas' pouch and made to pierce the broad ligament from behind forward, emerging in the anterior wound close to bladder. Care must, of course, be exercised not to include the ureters. After the ligature is tied on both sides the tissues between the ligatures and uterus are severed with the scissors, and the uterus is dragged farther down toward the vaginal outlet. The next section of the broad ligament is now tied in a similar manner on either side and cut with scissors between uterus and ligature. The third ligature generally reaches to the top of the broad ligament, including the tube and round ligament on either side. A clip of the scissors between the topmost ligature and the uterine cornu on either side will liberate the uterus, which is now removed. If it is desired to remove tubes and ovaries with the uterus, they are drawn down, either after removal of the uterus or with the latter, and the topmost ligature on either side is applied to the broad ligament outside of the tubal ostium. Tubes and ovaries are then cut out between the ligatures.

2. *The clamp operation* differs in no wise from the method of serial ligation of the broad ligaments, except that hæmostatic forceps of various shapes and sizes, according to the fancy of the operator, take the place of ligatures. The uterus, with or without the tubes and ovaries, is cut out between the clamps applied to control hemorrhage from the broad ligaments on either side. The handles of each pair of forceps are tied

with silk to prevent their opening, and the clamps allowed to remain from twenty-four to forty-eight hours, their handles being wrapped in antiseptic gauze.

3. *Enucleation with individual ligation of bleeding vessels.* After circumscribing the cervix by incision it is seized with strong volsella forceps and drawn well down; or a stout silk ligature may be passed through the cervix to act as a guy-rope in drawing it down. The uterus is freed from its surroundings by blunt dissection, aided, when necessary, by incisions with a hysterectomy knife or scissors. The author's preference is for the scissors aided by a tenaculum. The tenaculum is hooked into and draws taut the tissues immediately adjacent to the uterus, while the scissors divides them as close as possible to that organ. After a fair and patient trial of the hysterectomy dissector, the writer has been unable to accustom himself to its skilful use. Blunt dissection, aided, when necessary, by an occasional clip of the scissors, is thus proceeded with until the origin of the tube from the uterine cornu is reached on both sides, the peritoneum having, as already stated, been freely opened anteriorly and posteriorly.

FIG. 1.

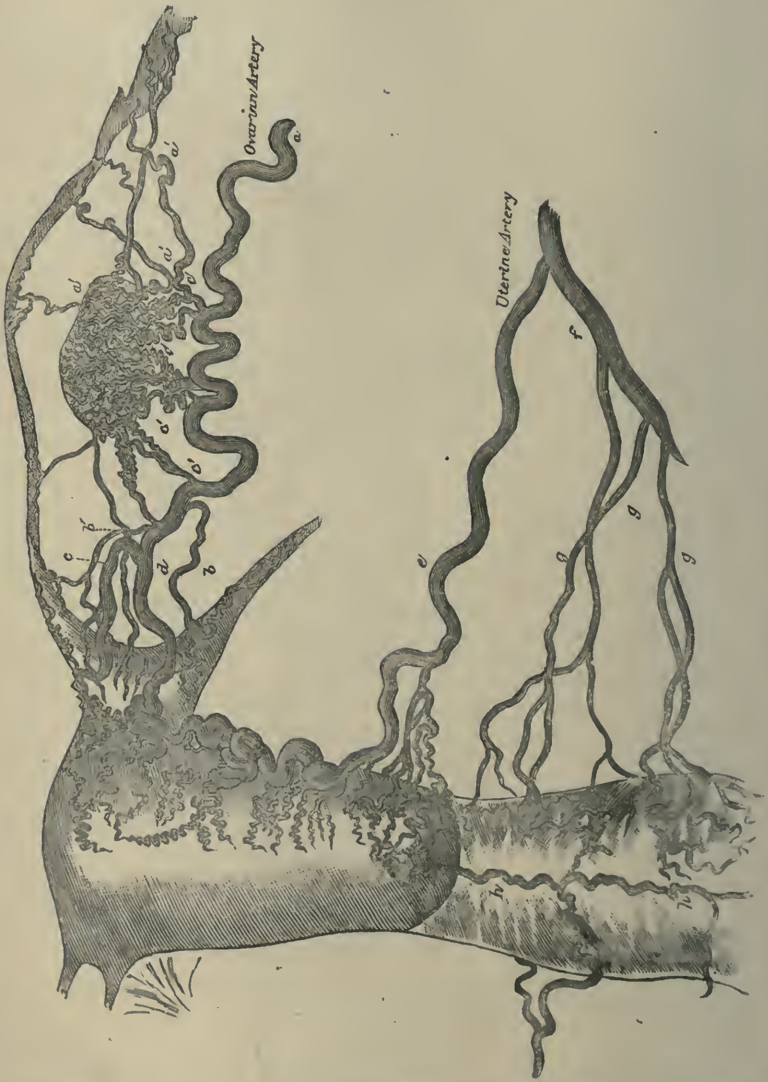


Cole's hysterectomy dissector.

Two cardinal principles are involved in the successful performance of vaginal enucleation of the uterus. The first is to carry the dissection as close to the uterus as possible. Hemorrhage is thus reduced to a minimum. The uterine arteries as they approach the uterus divide rapidly into smaller and smaller tortuous branches—the curling arteries of the uterus—which finally penetrate the uterus as arterioles of the smallest calibre. By dissecting very close to the uterus, we divide only these arterioles or capillaries, and the slight oozing from them almost immediately ceases spontaneously. In working further away from the uterus, larger vessels, requiring ligation, are divided.

The second cardinal principle involved is always to keep your immediate work well in view in the centre of the field of operation; to seize with forceps any spurting vessel that may happen to be divided and to immediately secure it with a slender catgut ligature. It will not do, however, to tie the ligature around the artery in the usual way. The danger of retraction of the artery and slipping off of the ligature is too great, and when the artery has once retracted outward into the folds of the broad ligament, it may become a serious and difficult task to again secure it. To be on the safe side, the transfixion ligature (Umstechungligatur) must be employed. The bleeding mouth of the artery is seized with forceps and slight traction made upon the vessel. This puts the tissues

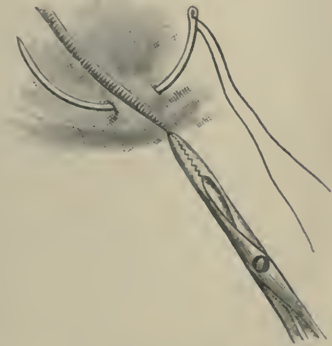
FIG. 2.



The ovarian, uterine, and vaginal arteries (HYRTL): *a*, ovarian artery; *a'* and *b'*, branches to tube; *b*, branch to round ligament; *c*, uterine artery; *c'*, branches to ovary; *g*, vaginal artery; *h*, azygos artery of vagina.

about the artery upon the stretch, and a needle carrying the ligature is passed underneath the artery, piercing in a part of its course the connective tissue surrounding the vessel. The ligature is then tied upon the side of the artery opposite to that on which the connective tissue has been pierced. A ligature thus tied cannot slip off.

FIG. 3.



Ligation with transfixion.

If it is desired to ablate the tubes and ovaries, the same blunt dissection, aided when necessary by the scissors, is carried close to the tubes and ovaries until the infundibulo-pelvic ligaments are reached. Divided bleeding vessels are separately secured by fine catgut ligatures. In all clean cases closure of the peritoneum is the next step of the operation, except in the clamp operation, in which an efficient closure is impracticable. In cases in which the peritoneum has been necessarily or accidentally defiled iodoform gauze tamponade of the lower pelvic cavity is practised.

The peritoneum is closed by a running Lembert suture of catgut. This is an easy matter when the uterus alone has been removed. When the tubes and ovaries have been ablated closure of the peritoneum becomes a more difficult undertaking; it is best accomplished by beginning at the infundibulo-pelvic ligament on either side and working downward toward the median line, where the two sutures meet and are tied to each other. A strip of iodoform gauze is loosely placed in the raw space between the vagina and the closed peritoneum. A little more of the same gauze is placed in the vagina, and the operation is completed.

Having finished the description of the routine operation according to each of the three methods, a few general considerations relating to the modifications of technique, to meet complications and the exigencies presented by the various indications upon which the operation is performed, are in order.

A narrow vagina need not necessarily contraindicate vaginal hysterectomy. The required room can be obtained by incision of the vagina on both sides, along its whole length if necessary. These incisions are best made in the postero-lateral direction. After completion of the operation the vaginal incisions are closed by suture.

In cases in which the uterine cavity contains infectious material the cervix may be closed by suture as a precaution additional to the sublimate irrigation and gauze tamponade of the uterus, prior to proceeding with the operation.

Should the bladder happen to be wounded, the injury is immediately repaired by suture. A running suture of fine chromicized catgut in two tiers, the deep tier extending down to but not penetrating the mucous membrane of the bladder, will answer the purpose. Frequent catheterization, or a permanent catheter, should form a feature of the after-treatment in cases of wounded bladder.

Adhesions do not contraindicate vaginal hysterectomy; they merely render it somewhat more difficult of performance. Separation of adhesions is effected in the same manner and on the same principles that obtain in cœliotomy.

The intestines are best kept out of the way during operation by elevation of the pelvis, when they gravitate toward the diaphragm in the same manner as obtains in cœliotomy in the Trendelenburg posture. The writer's operating tables, both stationary and portable, have proved very serviceable in this direction.

The operation may frequently be facilitated by inverting the fundus of the uterus into the vagina either through the anterior or the posterior opening in the peritoneum. When this course is considered desirable, and the uterus cannot be readily turned down by the fingers, our object may be accomplished by "climbing" up the anterior or posterior surface of the uterus with the aid of two tenacula forceps. The uterus is grasped at an accessible part of its anterior or posterior surface by the first forceps. Traction upon these brings into view a higher part of the uterus which is grasped by forceps No. 2. This releases forceps No. 1, which in turn grasps a higher part, and so on until the fundus appears and is pulled down into the vagina.

The one great disadvantage of the vaginal operation lies in the fact that it is sometimes very difficult to remove the tubes and ovaries when such removal is indicated. This difficulty and indication obtain chiefly when the diseased adnexa are adherent high up in the pelvis. The atrophy and shrinking of the tubal and ovarian attachments following the menopause may also render it difficult to bring these organs down into the field of operation for removal; their removal under this circumstance is, however, fortunately but rarely called for.

The after-treatment of vaginal hysterectomy with closure of the peritoneum is a very simple matter. The urine is drawn until the fourth day, when the gauze is removed from the vagina. After that the patient uses the bed-pan in emptying her bladder, receiving a vaginal douche of 1 : 3000 sublimate immediately after each urination. When the peritoneum has been left open and tamponaded with iodoform gauze, this gauze is removed on the fourth day, and a small quantity of fresh iodoform gauze introduced. This is removed on the seventh day, after which the vagina is douched after urination, as in the cases with closure of the peritoneum. Patients may sit up from the ninth or tenth day on, and generally leave the hospital at or before the end of three weeks after operation.

The three methods of vaginal hysterectomy above described may be properly designated as the German, the French, and the American. The Germans, almost to a man, practise serial ligation of the broad ligaments. The prominent exponents of the French school, following the lead of Péan, swear by the clamp. Enucleation with simple ligation of bleeding vessels, although probably practised in isolated instances elsewhere, first became established as a routine procedure in our own country, where it is rapidly gaining adherents. To Pratt, of Chicago, belongs the credit of having by his practice demonstrated the practicability and value, and by his teaching and writings disseminated a knowledge, of the method which justly bears his name. As already stated, the writer has practised each of the three methods. The clamp operation he soon abandoned, as to his mind eminently unsurgical. He has no further use for it, and will not again leave a clamp in the body except in the dire necessity of being unable to secure a bleeding point by ligature or torsion. Serial ligation of the broad ligaments presents the serious objection of unnecessary constriction of vital tissues richly supplied with nerves, bloodvessels, and lymphatics. Ligation is required merely to check hemorrhage, and this object can be accomplished by simply tying the bleeding vessels; all constriction or crushing of tissues beyond this is uncalled for, harmful and illegitimate. Vaginal hysterectomy by serial ligation of the broad ligaments is indicated only in cases of malignant disease in which we wish to give the uterus as wide a berth as possible. Enucleation of the uterus, with ligation of bleeding vessels only, appeals to my mind as a surgically ideal method of hysterectomy, suprapubic and vaginal. All my cases operated upon after this method, one abdominal and nine vaginal hysterectomies, have made good recoveries. The first vaginal hysterectomy bears date of May 18, 1894.

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ANTITOXINE IN DIPHTHERIA IN BERLIN, NEW YORK, AND IN THE MUNICIPAL HOSPITAL OF PHILADELPHIA.

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The new therapeutic agent antitoxine has been before us since 1890, when, at the hygienic institute at Berlin, Behring told us of its effects in rendering animals immune in diphtheria. He described the method of injecting small quantities of virulent cultures into the abdominal cavity of guinea-pigs.

It is a well-known fact that guinea-pigs are more sensitive to the action of diphtheritic poison than are other animals, and for this reason they serve the purpose of experimental work better than other animals. Behring modified the action of this virulent diphtheritic bouillon, by previously injecting his animals with iodine trichloride, and found that guinea-pigs could endure larger doses by this method than otherwise.

Behring read a paper in the summer of 1891, at London, before the International Congress of Hygiene and Demography, in which he detailed his methods and results.

Commencing with guinea-pigs, Wernecke then secured immunity in sheep, and Aronson in dogs; then oxen were tried, but yielding very unsatisfactory results were finally abandoned. In order to secure large quantities of serum it was tried on horses, and finding that immunity could be transferred they are at present utilized.

In speaking of serum or antitoxine I invariably refer to that derived from the blood serum of the jugular vein of the horse.

Theory of Immunity. Behring and Ehrlich found that by injecting small quantities of virulent poisons and allowing the animal to recover we could arrive at a certain point which could be called *tolerance* of their specific poison, and this tolerance is called *immunity.* It was further found that this immunity could be conveyed to other animals by injecting certain quantities of serum derived from the blood of immune animals, and this immunity would not only last for some time but would protect the animal against disease from this one toxic agent if injected. Behring found that this immunity applied to tetanus and diphtheria. Ehrlich used vegetable poisons, ricin and abrin, and produced immunity. This being, then, the foundation of serotherapy, it was found that certain quantities of serum, 0.1 c.c. would protect a guinea-pig weighing 400 gm., or 1 c.c. would protect a guinea-pig weighing 4000 gm. Thus the weight was transferred to human beings and the approximate quantity necessary to render a child immune was thus determined. At present two men are prominent in this work, Behring and Aronson. Both have prepared so-called "Heilserum." Another kind of serum prepared is called "Immunisirungs-Lösung." The former is healing serum, powerful, and is to be applied where diphtheria has already manifested itself. The latter serum is to be used as a prophylactic.

While in Berlin last summer I was permitted to see cases of diphtheria in the *Institut für Infektions-Krankheiten*, through courtesy of Dr. Wasserman—five malignant cases, all of which recovered.

It is proper to state that the so-called Koch's Institute for Infectious Diseases was erected at the time of the tuberculin era, and is still used for this purpose. In this institute Behring's serum only is used. The largest Children's Hospital for Infectious Diseases is under the directorship of Prof. Baginsky—known as the Kaiser und Kaiserin Friedrich Kinderkrankenhaus, where Aronson's serum only has been used.

Extended courtesies by Prof. Baginsky and Dr. Hans Aronson gave me opportunity of acquainting myself with the method and details of antitoxine. I need only refer to statistics given to me by Prof. Baginsky, who stated that, averaging all mild and malignant cases, the mortality was in three years from 1890–93 out of 1081 cases of diphtheria treated 421 deaths, or 38.9 per cent. mortality.

From January 1 to March 14, 1894, there were 86 cases, with 38 deaths, a mortality equal to 41.8 per cent. On March 14th Aronson's antitoxine was first used, and until June 20th there were 128 cases treated with the same remedy—of these 128 cases, 17 died, or a mortality of 13.2 per cent.

Baginsky's statement is well worth repeating, that "We have never had such a low mortality with our mildest epidemics and our best form of treatment."

The following cases treated by me will serve to illustrate how antitoxine was used, and the results:

Case I.—Dora T., aged eleven years, a healthy, well-nourished girl, had been ill about one day. In an adjoining room, a boy, aged fifteen years, was sick with diphtheria. My patient was exposed, and her mother examined her throat and discovered patches. When I first saw her I found the temperature in the axilla $102\frac{3}{5}$° F. There was intense thirst, general pains in the body, marked malaise, dysphagia, and a headache. Pseudo-membranes covered both right and left tonsils and the posterior pharyngeal wall. I ordered a placebo.

I first made a culture from the throat, the report proved Klebs-Loeffler bacilli, verifying the clinical diagnosis. I then injected 5 c.c. of serum, in the presence of Dr. Gerlach, of the New York Post-Graduate Hospital, with a small hypodermatic syringe, at which injection some serum was wasted. I then took a better syringe, and injected 5 c.c. of Aronson's serum in the back by pinching a fold of skin between the shoulder-blades. No reaction followed. The next day my patient was greatly improved. Greenish-yellow pseudo-membranes remained about two days following the injection, and on the third day no traces of membranes were visible, although the pharynx and tonsils were still inflamed. On the fourth day no sign of the disease remained, and the little girl was up and hungry. The general malaise seemed to pass off about one day after the injection.

This patient was attacked much more severely than the first child that infected her. A careful examination of the urine was made. Albumin sparingly and an excess of phosphates were present. The trace of albumin also disappeared. No reaction followed the injection of antitoxine.

Case II.—H. F., aged two years and two months; had never been sick until October 16th; examination by Dr. Berger showed lungs normal; temperature 102° F.; severe inflammation of pharynx and tonsils on both sides. The following day a slight grayish-white pseudomembrane was visible; the temperature remained 102° F.; the child was apparently very sick.

On the following day the child showed signs of dyspnœa; this continued until October 18th, when the temperature rose to 103° F.; cough appeared; pseudo-membrane extended to both tonsils, pharynx, and uvula; evening temperature rose to 104° F.; severe laryngeal stenosis; pulse 140; left lung behind showed sign of dulness. October 19th, child very restless; urgent dyspnœa, which necessitated intubation. The latter was done by Dr. Isaac M. Rottenberg, who pronounced it a septic case and gave a grave prognosis. It was also agreed by Dr. Goldberger that no chance of recovery existed. At 2 P.M., on October 19th, 20 c.c. of Aronson's antitoxine was injected by me in the intra-scapular region in the presence of Dr. Berger. The child seemed to breathe easier after intubation, but passed a restless night. Injection of antitoxine showed no local reaction. October 20th, temperature 103° F., pulse 120; slight dulness on percussion; pseudo-membranes appear the same. On the night of October 20th the child appeared easier; breathing less difficult; temperature 102° F.; pulse 110. On the following day, about forty eight hours after injection of antitoxine, it was decided to extubate, as all grave symptoms seemed to have subsided. The respiration improved hourly, and the membrane commenced to melt away. Temperature (evening) was 101° F., pulse normal. On October 21st there was noticed a few small pinpoint disseminated plaques on pharynx, looking like tonsillitis follicularis in contrast to one huge mass of grayish-white membrane completely hiding the pharynx and tonsils and uvula. On October 22d, temperature and pulse normal, no macroscopic evidence of local disease, and child apparently well and discharged as cured.

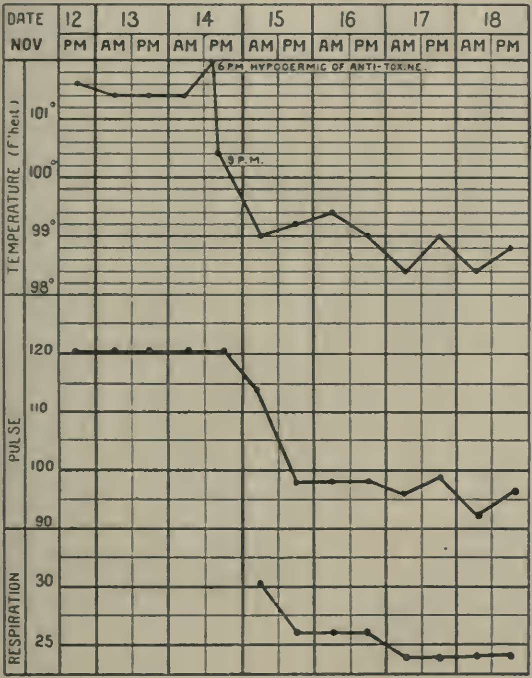
This is the most striking case of all, and astounded the attending physicians, as this case was considered hopeless and beyond medical control.

Case III.—Child; he was seen in consultation with Dr. S. Cohn. Diagnosis, laryngeal croup (diphtheritic). The usual harsh, ringing, croupy cough was distinctly noticeable, and it appeared that unless intubation was rapidly performed asphyxia might result. At midnight 10 c.c. of Aronson's serum was injected by me into the intra-scapular region. This was not followed by any local reaction. Child improved gradually, and although no further medication was used, was reported well on the second day. This was one of the worst cases, for the laryngeal symptoms were well marked, besides the elevated temperature.

Case IV.—F. V., aged six-and-a-half years, predisposed to catarrhal tonsillitis; taken sick November 11th. Mother discovered white deposit on tonsils. Sent for Dr. Valentine on November 12th. Examination showed that right tonsil was completely covered with a thick membranous deposit, and also a long narrow deposit on the mucous membrane covering palato-pharyngeus muscle behind left tonsil, which moved up and down with it. The post-nasal cavities were plugged. Axillary temperature, 101.4° F., pulse 120.

November 13th. Both tonsils more swollen; left one also well covered with membranous deposit. Discharge from nose thick, tenacious, and profuse. Pain in right ear, back of neck, and back of head. Child drowsy. A. M. temperature 101.4°; pulse 120, P. M. 101.6°; pulse 120.

16th. Attempted to pull membrane off with forceps, which latter slipped, and bleeding resulted. Extension on anterior fauces in front of left tonsil, and in front of uvula. Nares absolutely occluded.



I saw the case about 6 P. M. and injected 20 c.c. of antitoxine of the strength of 1000 antitoxine normal units, in the presence of the nurse and Dr. Valentine. The injection was thrown deeply into the connective tissue of the inter-scapular region to the left of the spine. Temperature at time of injection, 102°; pulse, 120, at 6 P. M. At 9 P. M. of same evening, three hours later, temperature fell to 100.4°; pulse, 114. Extension of membrane to roof of mouth upward from left tonsil about an inch long and three-quarters of an inch broad. The cervical glands swollen on left side. Bloody mucus from left nostril. All former medication stopped and nurse directed to swab the throat hourly with a 1:2000 bichloride of mercury solution. The new membrane discovered in the morning looked shrunken, and there was no fresh deposit. Right tonsil less swollen. 5 A. M. Temperture, 99°; pulse, 100. No new membrane in throat, but continual shrinkage in size and thickness. Pulse weak and irregular. Stimulants hourly. The membrane melting, and the tonsils assuming normal shape and size; the swelling of cervical glands lessened. Patient feeling well. Nourishment every two hours, succeeded by teaspoonful of *bovinine.* Stimulants hourly, from Thursday morning until Saturday morning. Nasal irrigation was done every three hours, with lukewarm normal saline solution. Two immense plugs of membrane were discharged from nose. The nasal passages remained clear. Treatment was continued by Dr. Valentine.

The diagnosis in all cases was confirmed by a bacteriological culture made by removing a small particle of membrane from portion which appeared oldest, and stroking over agar-agar or blood-serum, and placing in the thermostat. In some instances I submitted inoculations to other bacteriologists and sent cultures to New York Health Department.[1]

CASE V.—A. H., aged nine years, first complained of being unwell Saturday, October 6th; general malaise, feverish and debilitated, loss of appetite, disposed to keep the recumbent posture. Was first seen Sunday morning October 7th. Debility extreme. Skin hot and dry. Temperature 102°. Pulse 120. Coated tongue, foul breath, and examination showed a mass of exudation which completely filled the fauces; nasal breathing obstructed. Diphtheria of a low type diagnosticated. Put upon the bichloride $\frac{1}{40}$ and tinc. ferri chl. ♏v, every three hours, and throat sprayed hourly with weak solution of chloride, and for nourishment whiskey punch freely. Made culture and forwarded to Board of Health. Secured five grammes of antitoxine and gave the whole amount in one injection between shoulder-blades. This was accomplished at 7 P.M. Sunday, when the disease had been present at least forty-eight hours, possibly seventy-two hours, in view of the extent of surface involved by the exudate, although no attention was called to the throat until the morning of the day that the antitoxine was used. No reaction followed the injection. Patient passed a feverish, restless night, and was found no better Monday morning. Report on culture from Board of Health, "true diphtheria." Cadaveric odor from throat almost intolerable. Heart action weak and debility even more pronounced than on previous day. Temperature 100.5° to 102°. Pulse feeble, 120. Positively refuses to take stimulant in any form by mouth. Condition of throat makes deglutition difficult. Appearance of exudate about the same as at the time of the injection the night before. Directed continuance of bichloride treatment and was hourly rubbed and bathed in hot brandy, keeping hot brandied cloths to bowels continuously. Monday evening no progress noted and the case assuming a grave aspect. Prognosis unfavorable. New remedy considered inert.

Tuesday morning (thirty-six hours after the use of antitoxine) evident change for the better. Temperature steadily falling. Pulse stronger. Tongue cleaner. Exudate loosening at edges, and surrounding parts look bright and healthy. Improvement continued through the day. Free flow of saliva and mucus from throat, but no membrane exfoliated. It appears thinner and is evidently melting. More comfortable night and evidences of gain in every way.

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[1] To Miss Philipps, the nurse in charge of this case, I am greatly indebted for the accurate report, and for temperature, pulse and respiration charts.

Wednesday morning. Temperature nearly normal. Pulse 86. Odor from throat nearly gone and membrane rapidly disappearing. Can see underlying surface, and whole appearance is fresh and healthy. No masses or flakes of membrane were loosened or coughed up. It all appears to be melting away.

Thursday. Temperature touched normal. Pulse 86. Throat nearly clear. Nasal passages much freer. Patient declares himself well, and his general tone is excellent. Hungry and calling for solids. Urine examined and found free from albumin.

Friday. All visible throat free from exudate. Tongue slightly coated, but moist on edges. Breath entirely free from odor. Temperature 97.5° to 99°. Report on culture taken on Thursday, Loeffler's bacilli still present.

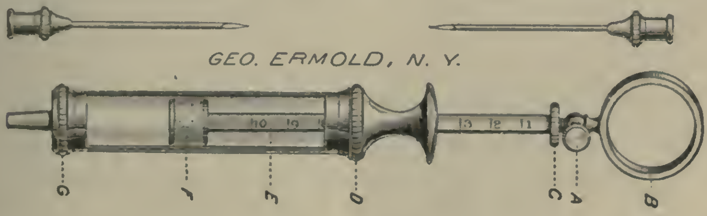
Saturday. Child to all appearances well. Throat normal. Nasal passages open. No evidence of the disease about him. Temperature averaging normal.

Sunday. One week from the use of the antitoxine. Would declare the child quite well, but find report on culture reads, bacilli still present. Kept child quarantined and in bed for ensuing week, and on eleventh day sent culture to the laboratories of both New York and Brooklyn Boards of Health to secure comparative tests. Reports from both read, bacilli present. Persistent nutrition kept up and throat sprayed with Seiler's solution and the bichloride alternately.

Seventeenth day. Sent another culture, and same report is returned. Have not detected any evidence of the disease since Saturday, October 13th, six days after hypodermatic was given, but culture made on 23d inst. still shows characteristic bacilli, and this return was made on every culture until the twenty-first day, when the Board of Health declared them absent. No albumin found save on eighth day, and then only a trace.

(The last case is published by permission of Dr. Catlin, of Brooklyn.)

The syringe used consists of an ordinary glass barrel like any ordinary aspirating syringe, but the fittings are made with asbestos and



linoleum. I have tried to do away with the linoleum, and have had Mr. Ermold construct the syringe of asbestos only. It can easily be sterilized by boiling. The syringe holds about 10 c.cm. or enough for one hypodermatic injection of antitoxine. The calibre of the needles is very large owing to the thick consistence of the serum.

In looking over my list of cases I find that the most instructive were Case V., in consultation with Dr. Catlin, of Brooklyn, Case II., in consultation with Dr. Berger, of New York, and Case IV., in consultation with Dr. Valentine, of Brooklyn.

The most rapid result was achieved in Case III., in consultation with Dr. S. Cohn of this city; laryngeal symptoms subsided in about twelve hours. The following cases were treated in the Municipal Hospital of Philadelphia, through the courtesy of Dr. Welch, physician in chief, and Dr. Bemis, house physician:

CASE I.—F. N., two-and-a-half years old, white, female, of Russian descent, had been ill a little longer than forty-eight hours when admitted to the hospital, October 2d. On admission the tonsils were large, inflamed, and covered with an extensive exudate, dark-gray in color, and the breath was fetid. There was also involvement of both nares. The glands of the neck were somewhat enlarged, and the color of the face was pale and sallow. The temperature was 100.2°; pulse, 124; the respirations, 24. Ten cubic centimetres of the antitoxine were injected at 6 P.M. (the day of admission). During the following twenty-four hours the temperature was recorded hourly, and varied between 99° and 101.4°; the pulse between 100 and 138 beats per minute; the respirations were from 16 to 28. The exudate in the fauces continued unchanged; there was free discharge from both nares; the greater part of the time this discharge consisted largely of blood. There was also oozing of blood from the mouth; the breath was fetid; the pallor was increasing and of a leaden hue. On November 4th the exudate in the fauces was unchanged; there was considerable epistaxis; the glands in the neck were enlarging; the temperature ranged from 98° to 100°; the pulse was 120; the respirations about 36. On November 5th the exudate in the fauces was not diminished; there was continued epistaxis; the breath was still fetid; the glands in the neck were even larger; there were some purpuric spots on the face; the color was very pale; prostration was great; the temperature ranged from 100.6° to 102.6°; the pulse was 140; the respirations, 28. At 1 P.M. of this day a dose of the stronger preparation of Aronson's antitoxine was injected by me. At 7 P.M. of the same day the condition of the patient was unchanged. For twenty-four hours after the first injection no other treatment was employed except the liberal use of milk and stimulants. Subsequently tincture of ferric chloride and mercuric chloride were given every two hours, and hydrogen dioxide applied locally every hour to the nares and fauces; strychnine sulphate, gr. $\frac{1}{100}$, was also given every six hours, continuing, of course, the free use of milk and whiskey.

On November 6th the exudate in the fauces was thinner, though still dark in color; blood was slowly dropping from the nose; the glands in the neck were somewhat diminished in size; the temperature, pulse, and respiration were unchanged. The pulse had considerable volume. Exhaustion had not increased, and the child took nourishment freely. On November 7th the exudate in the fauces had increased since the previous day, and a few small purpuric spots remained on the face. Epistaxis had ceased, though the nose was somewhat moist from blood. A large ecchymosis on the thigh appeared where the first dose of antitoxine was injected; the temperature was about the same, and the pulse was very weak indeed, just barely perceptible at the wrist, and could not be counted. The extremities were cold, the face pale and livid, and there was great drowsiness. The child was disinclined to take nourishment; there had been no bowel movement for twenty-four hours. Tinct. ferri chloridi and hydrarg. chlor. corrosiv. were continued every two hours, and hydrogen dioxide was applied to the throat. Strych. sulph., gr. $\frac{1}{100}$, every four hours, and whiskey and milk were ordered at short intervals. At 12 midnight, $\frac{1}{50}$ gr. strychnine sulph. was given hypodermatically.

On November 8th the exudate in the fauces had very much increased, covering not only the tonsils, uvula, and the anterior half-arches, but extending forward in front of the uvula. The exudate in the nares was also increasing; the glands in the neck were sensitive but not swollen. The temperature ranged between 97.6° and 99.8°; the pulse was just barely perceptible at the wrist; the heart's action was feeble, and the extremities were cold. In spite of this condition the child appeared bright and took milk fairly well. Strychnine sulph., gr. $\frac{1}{100}$, was ordered every three hours until two or three doses should be given.

At 5.20 A.M., 10 c.c. of Behring's antitoxine were injected. At 6.10 P.M., sulphuric ether ♏xv, was given hypodermatically, also at midnight gr. $\frac{1}{100}$ strychnine sulph. hypodermatically. On November 9th the exudate in the fauces was very much diminished; the heart's action was very weak, the pulse just perceptible at the wrist, but could not be counted. The temperature was about the same. The expression of the child was bright, but it took nourishment less willingly. There had been no bleeding from the nose for three days. Injections of strychnine were continued, gr. $\frac{1}{100}$ every four hours, and artificial heat was applied to extremities. At 2 P.M., 10 c.c. of Behring's antitoxine were again injected.

On November 10th there was still considerable exudate in the fauces and also in the nares; the heart's action was feeble, and the pulse at the wrist was still almost imperceptible; the extremities were cold, and the child took nourishment and stimulants somewhat reluctantly. Three hypodermatic injections of strychnine sulph. $\frac{1}{100}$ of a grain, were made in the last twenty-four hours. The child's expression, when awake, was quite bright. The heart-sounds were growing less and less audible, and death occurred at 10 P.M. from asthenia.

CASE II.—E. G. T., aged two years and eight months, white, female, born in Philadelphia, was admitted to the hospital October 2d, having a well-marked exudate on both tonsils and in one of the nasal cavities, of less than forty-eight hours' standing. At 6.10 P.M. on the day of admission 10 c.c. of Behring's antitoxine were injected. During the following twenty-four hours the temperature varied between 99° and 100.8°, being about the same as before the injection was administered; the pulse-rate was between 120 and 135; the respirations were from 20 to 30. The exudate on the tonsils seemed unchanged, as did that in the nose, except that the discharge from the nares was slightly less. On November 4th the exudate in the fauces and nares had neither extended nor diminished; the temperature was unchanged; the pulse-rate and respirations were about the same. On November 5th the exudate in the fauces and nares was unchanged, except that both nares were now involved; the glands in the neck were only very slightly swollen; the general condition of the child remained about the same as when the injection was given, with slight improvement. The child received the same internal and local treatment as the previous case, and took nourishment freely.

On November 6th there was but little change in the exudate in the fauces; the temperature had risen to 101.6°, and the rash of scarlatina had appeared. A sister of this child had developed scarlet fever two days previously. On November 7th the exudate was diminishing both in the fauces and nares; the temperature ranged between 100.8° and 101.8°; the pulse was 120. On November 8th the exudate in the fauces had disappeared; in the nose it was dry and much less distinct; the temperature was 101°. On November 9th there was no exudate in the fauces, and very little in the nose. The rash of scarlet fever was just barely characteristic. The child's general condition was much improved, and she had quite recovered from the diphtheria. The attack of scarlatina was very mild.

On November 12th gradual improvement was noted, and there was no exudate in the fauces, but there was still a very little in one nasal cavity. The temperature was about normal, and, from the time the scarlet fever began, it had not been higher than 101.8°. The pulse was 120. Desquamation commenced on this date. The child took nourishment well.

Case III.—A. J., thirteen years of age, colored, was admitted November 3d, having been ill four days. The exudate in the fauces covered the tonsils, the anterior half-arches, and the uvula completely. The temperature was 101.6°, the pulse 100, the respiration 28. There was only one very slight enlargement of the glands of the neck. There was no nasal involvement. Tinct. ferri chloridi and hydrarg. chlor. corros. were given internally every two hours, and hydrogen dioxide was applied locally every two hours. On November 4th the condition of the fauces remained unchanged; the temperature was 99.2°, the pulse 86, the respiration 25. A 1 per cent. solution of formalin was applied to the throat every two hours alternately with the hydrogen dioxide. On November 5th the exudate in the fauces remained the same; there was no increase of swelling of the glands of the neck; the temperature was 99°, the pulse 88, the respiration 20. There was very little exhaustion, and the child took nourishment well. At 1.10 p.m. I injected 10 c.c. of Behring's antitoxine (a bacteriologic examination was made by Dr. Kyle, and typical bacilli were found). Following this the temperature ranged between 100° and 106°. On November 6th the exudate in the fauces continued much the same, though somewhat thinner on the uvula. The temperature ranged from 98.4° and 98.8° to 100.8°; the pulse was about 90, the respiration about 20. The same internal and local treatment was continued; the child took nourishment and stimulants freely. On November 7th the exudate in the fauces had greatly diminished; the temperature was 99.4°, the pulse ranged from 80 to 90, the respiration was 18; nourishment was taken as usual, and the patient slept well. On November 8th the exudate was diminishing rapidly, the swelling of the uvula was much less, and exhaustion was not great. On November 9th the exudate was much thinner and had disappeared in part, though considerable still remained. The same local and internal treatment was continued. The patient was now doing very well, and was placed on the regular house-diet.

On November 10th the general condition continued favorable; the fauces were quite free from exudate, but a little still remained on the uvula. Albumin continued in the urine in the same proportion.

On November 11th there was no exudate in the fauces except a little on the uvula; the temperature and pulse were about normal; the child took nourishment well, and strength was increasing. On November 12th there was a mere trace of exudation on the uvula; the temperature ranged between 98° and 100°; the pulse and respiration were about normal. The child was anxious to sit up.

CASE IV.—B. M., white, male, aged five years, was admitted October 18th, on the third day of the disease. The exudate in the fauces was very great, covering the tonsils, the uvula, the anterior half-arches, and extending on the roof of the mouth in front of the uvula; there was also nasal involvement. The glands of the neck were enlarged. On October 19th the child was bleeding from the nose and mouth. On November 20th the exudate was unchanged, and there were croupy symptoms. On October 23d the general condition was about the same; the albumin on this date was about 60 per cent. of the bulk of the urine. The temperature had been running from 101° to 102°, the pulse from 100 to 118, the respiration from 22 to 26. On October 25th the exudate had diminished and epistaxis has ceased. The temperature was about 99°, the pulse 100, and the albumin was only 10 per cent. by bulk. On October 30th the fauces were almost free from exudate; no albumin was found in the urine; the temperature was about normal, sometimes subnormal; the pulse ranged from 96 to 100. There were marked evidences of toxemia; there was great pallor and weak heart-action. On November 5th the temperature had been ranging from 100° to 102.6°; there was no albumin in the urine; the pulse was from 98 to 112. There was a mere trace of exudate in the fauces, and still some nasal involvement; the pallor and prostration continued; there was a feeble pulse, and the cervical glands were still enlarged. There was an herpetic eruption on the lips. At 1.30 P.M. I injected 10 c.c. of Behring's antitoxine, the Klebs-Loeffler bacteria having been found to be present by Dr. Kyle. On November 9th the patient was gradually improving; the temperature was from 98.6° to 100°; the pulse from 90 to 120; no exudate existed in the fauces, and that in the nares was gradually growing less; the color was also improving, and the child took nourishment well. The general condition was much improved.

On November 12th the fauces were entirely free from exudate, and only a very little remained in the nares; the temperature was 98.6°. No albumin had been found in the urine for several days past. The child was constantly improving.

On November 15th no exudate could be seen in the fauces, but the nares had not quite assumed their normal appearance. The temperature and pulse were normal, and the appetite was good. The urine continued free from albumin. On November 19th the patient sat up a short while for the first time; the improvement continued, although the circulation was feeble and the pallor extreme. The fauces, with the exception of marked redness, seemed healthy, but the nares were still somewhat abnormal. The appetite continued good, and the patient had apparently gained in weight. In this, as well as in the preceding cases, tincture of ferric chloride was continued three times daily, together with a nutritious diet.

On November 20th the child was somewhat indisposed, and the temperature was found to be 101°. During the two preceding days the patient had been sitting up.

On November 21st a rubelloid rash covering the trunk and extremities appeared. The temperature fell to normal, or nearly so, and the appetite was as usual. There were no catarrhal symptoms.

On November 23d the temperature continued normal, and the rash had entirely disappeared, without leaving the mottled condition of the skin peculiar to measles; hence the diagnosis of that disease must be excluded. There was no albumin in the urine, but there was slight evidence of paralysis.

CASE V.—A white male, eight years of age, was admitted November 9th, having been ill seven days. The exudate in the fauces covered the tonsils, the anterior half-arches, and the uvula, and extended a short distance on the roof of the mouth in front of the uvula; both nares were also involved. The breath was offensive; the glands on both sides of the neck were considerably enlarged, and the skin over the swollen glands was red. The temperature was 102.8°, the pulse 136, the respiration 36. Ten c.c. of Behring's antitoxine were injected under the skin on the back at 12 o'clock M. by me. The patient was at this time taking internally about 6 minims tinct. ferri chlorid. and $\frac{1}{32}$ gr. of mercuric chloride every two hours; locally, hydrogen dioxide undiluted, alternately with a one per cent. solution of formalin, was applied every hour, whiskey ʒij every two hours, and milk *ad libitum*. On November 10th the temperature was 100°, the pulse 120, the respiration 32. The exudate in the fauces remained about the same, except that it presented the appearance of peeling off in some places; in the nares the exudate was unchanged; the glandular swelling also remained about the same. The child at times was drowsy, and at other times restless.

On November 11th the exudate in the fauces and nares remained about the same; it was still dark in color and the breath was offensive. The glandular swelling had not increased. The temperature was about 100°, the pulse 128, the respiration 32. Albumin was found in the urine in the proportion of about one-tenth part of the bulk of the urine. The child took nourishment well.

On November 12th there was very little, if any, change in the exudate in the fauces and nares; at times there was slight epistaxis. The temperature was 99.8°, the pulse 116, the respiration 26. There was no increase of the glandular enlargement; exhaustion was not great; and the child continued to take nourishment and to rest well.

On November 13th the exudate in the fauces was somewhat thinner, and that in the nares also seemed to be slightly diminished. The temperature ranged between 98.4° and 99.6° F.; the pulse was more feeble, but the respirations were unchanged. Nourishment was taken, though somewhat reluctantly, and vomiting occurred once or twice. The heart's action was weak and the extremities were growing cold. Strychnine sulphate was ordered in doses of gr. $\frac{1}{100}$ every four hours, and the whiskey was increased. On November 14th the exudate in the fauces had diminished still further; the pulse ranged from 96 to 104, and was almost imperceptible at the wrist; the respirations ranged from 20 to 30; the temperature ranged from 98° to 98.4°. Albumin was found to be present in the urine (about 2 per cent. by bulk). The extremities were constantly growing colder; vomiting was occurring occasionally; the child took nourishment and medicines more reluctantly; the pallor of the face was increasing, and the patient was rapidly losing strength. Spiritus ammonii aromaticus in fʒss doses was ordered every half hour, and strychnine sulphate, gr. $\frac{1}{100}$, hypodermatically, every four hours. The exhaustion progressively increased, and death occurred from toxemia at 10 o'clock P.M.

In conclusion I desire to say that many of my cases not reported are from private families who begged me not to publish them; from several other cases my detailed reports are lacking—these will be published later.

To sum up: I have injected in all 34 cases; of these 29 were malignant cases, in which a grave prognosis was given by the attending physician or by myself in consultation; 4 were mild cases in the commencement of the disease, and one case was moribund.

By *malignant* I mean cases that had either distinct evidence of sepsis, showing low temperatures or very high temperatures, and where marked somnolence was evident, where cervical glands were considerably enlarged, and where at times the skin showed, in addition to cold, clammy perspiration, a decided icteric appearance; where there was also a foul mouth, a distinct cadaveric breath, and where only a grave prognosis was given. Such cases not only showed pharynx, tonsils, and uvula involved, but also symptoms of stenosis of the larynx and occlusion of the nares.

By *mild* I mean such cases as were seen on the first few days of illness, where the membranes were limited to either small areas of the pharynx, tonsils, or uvula, and where no complications of larynx and nares were observed. Mild cases were also those in which small quantities of albumin in the urine were noticed, and where no pulmonary or distinct nephritic complications could be diagnosticated.

The moribund case referred to was the one seen in consultation with Dr. Welch at the Municipal Hospital of Philadelphia, and the child not only was pulseless, but had cold extremities and showed marked evidence of general septicæmia. Still it lingered a number of days, showing the influence of the strong Aronson serum in neutralizing the toxic elements.

I have had 34 cases—30 malignant and 4 mild—32 of which recovered. I have 32 cures and 2 deaths—in all 34 cases treated, or a mortality of 5.8 per cent.

These cases were not selected, for some were poorly nourished, some in excellent vitality, with careful nursing, good hygiene. The main point was to apply the antitoxine as early as possible, and counteract the septic matter absorbed, and thereby avoid complications, besides using the local treatment of swabbing the throat with a 1 : 2000 bichloride of mercury solution, using a fresh swab for each application, and burning the same immediately after using it.

The technique of injection is simple. Having properly sterilized the syringe by boiling and using 0.5 per cent. tricresol, I commence by injecting 10 c.c. in mild cases, and 20 c.c. in malignant cases, by pinching a fold of the skin in the intra-scapular region, and allowing the serum to be slowly injected. I believe it proper, however, to have a syringe of suitable size and inject the required amount, rather than inject several places. The calibre of the latter must necessarily be quite large, owing to the thickness of the serum, which is at times rather mucilaginous. It is proper to note all differences and effects on the false membrane and the swelling of the glands, the behavior of the temperature, the condition of the urine, the effect on the heart, and especially the pulse.

There should be no hesitation in injecting on the second day, and, if no effect is seen, repeating the injection on the third day, as there is absolutely no risk from the injection. It is a perfectly safe remedy, and shows no immediate reaction. It differs from tuberculin and vaccine in that it causes no reaction. A case of antitoxine treatment will show no symptoms directly attributable to the remedy, unless it be in some cases urticaria. The temperature does not fall by crisis, but by lysis, with antitoxine treatment. Massage of the serum after the injection should not be practised, according to Heubner, Aronson, Baginsky, and others.

Let us not lose sight of the fact that in the use of this new agent we are treating diphtheria, and that all discharges, be they from the nose, throat, or mouth, and possibly feces and other excrements, should be subjected to a rigid disinfection. This, if possible, before leaving the body. For this purpose local swabbing of all visible membranes with a 1 : 2000 bichloride of mercury solution, using glass rods with absorbent cotton—the latter to be burned immediately after swabbing; the glass rod to be put into bichloride solution. We still require most thorough naso-pharyngeal antisepsis for this purpose, lukewarm (105° to 110° F.) normal table-salt solution, injecting either nostril until the stream flows out of the other side, using considerable force at times. Great attention must be paid to the recumbent posture, which has been so strongly advocated in Berlin, especially so where the patient's heart is weak from diphtheritic poison, and the child is douched while flat on its back, with a rubber sheet around its arms and neck to prevent useless struggling, so well known in the former method of syringing in the sitting posture. One nostril only need be irrigated until the saline solution flows out of the other side.

Stimulation should be cautiously followed out. It should be used where there is weakness of pulse and where the heart's action is slowed —then, however, it should be freely administered; good Tokay, and Baginsky advises Greek wines (Mavrodaphne), and other kinds. These latter wines, being sweet, are very greedily taken by children. Neither the ice-collar nor any other form of external local application was used in my experience abroad or in this country with the serotherapy.

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BACTERIOLOGICAL STUDY OF FOUR CASES OF DIPHTHERIA TREATED WITH ANTITOXINE BY DR. LOUIS FISCHER AT THE MUNICIPAL HOSPITAL, PHILADELPHIA.

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While much has been written on laboratory technique in the study of the bacillus of diphtheria, yet the subject is of sufficient interest and importance to necessitate the publication of the methods employed in the study of these cases.

The bacillus of diphtheria grows best on blood-serum prepared after the method of Loeffler. The following was the mode of procedure in this laboratory study:

A wide-mouthed jar, with a ground-glass stopper, which has been thoroughly sterilized, is taken to the slaughter-house and filled with freshly-shed blood of the ox or sheep, young animals being preferable. The skin of the neck of the animal to be killed is shaved, washed with soap-water and a brush, then with alcohol or ether, or a 1:1000 solution of bichloride of mercury may be used if the skin is again washed thoroughly with boiled water. One of the great vessels of the neck, preferably an artery, is then opened, and the blood is allowed to spurt directly into the prepared receptacle. The edge of the jar is then cleansed and the jar is sealed by means of the ground-glass stopper, and set aside until the blood has firmly clotted. The jar is then removed to the laboratory, and placed in an ice-chest for twenty-four hours. It should be examined every few hours, and if the clot tends to adhere to the sides of the jar it should be loosened by means of a sterilized glass rod. There should be placed in the ice-chest at the same time the beef from which the nutrient broth is to be made. Take one pound of finely-chopped lean beef, to which is added one litre of water; this is allowed to stand for twelve hours. The meat and water are then placed in a cheese-cloth or towel and the fluid pressed out. The fluid thus obtained should be heated and again filtered through a towel, and the amount brought up to one litre by the addition of distilled water; to this is added 1 per cent. of peptone, 1 per cent. of glucose, and 0.5 per cent. of common salt. If the fluid has an acid reaction a few drops of saturated solution of bicarbonate of sodium may be added. The mixture is then boiled for half an hour and filtered through absorbent cotton into sterilized flasks; then sterilized for half an hour. While the serum is collecting test-tubes may be cleansed and sterilized. Two sizes of tubes are needed. A tube four inches long and two-thirds of an inch in diameter may be used for the serum, while a tube six inches long and three-quarters of an inch in diameter is used for the cotton swab. The tubes are carefully washed and dried, then plugged with cotton so wrapped that its surface will be smooth, and when withdrawn from the test-tube will not spread out, but remain firm.

The tubes to be used for the swabs are prepared as follows: A stiff steel rod (an ordinary knitting-needle may be used) is passed through a plug of smaller diameter than the tube. The plug is wrapped so as to firmly hold the steel rod, which is passed through layers of cotton until the plug will tightly fit the calibre of the tube. The end of the rod which is placed in the tube is then wrapped with a small piece of cotton, which should be loose and fluffy at the end, but tightly adherent further up the rod. This arrangement can be effected by frilling the cotton and extending the fine fibres well up on the rod and wrapping firmly toward the end. The swab is now introduced into the tube, which is placed in an incubator and exposed to dry heat at a temperature of 150° C. for at least one hour. This should be repeated two hours before using the tube. The blood-serum is now siphoned off through a sterilized glass tube and mixed with the nutrient beef-broth in the proportion of 3 to 1. The serum is poured into the sterilized test-tubes by means of a sterilized pipet, which should be inserted to the bottom of the test-tube so as to avoid the formation of air-bubbles and to secure a perfectly even surface. Two c.c. of the serum are sufficient for each tube. The tubes are now placed in an incubator and kept at a temperature just below the boiling-point, care being taken to have them inclined in order to obtain a wide surface for the growth of the inoculated germs. Great care must be taken that the serum does not boil.

If kept for several hours at a temperature just below the boiling-point, and if the process is repeated two or three times after intervals of twelve hours, the serum will remain sterile. The serum thus prepared is opaque, yet firm. The tubes can be placed in glass jars, sealed by means of a clamp-top, and kept for months. The method given by Ball is much shorter and equally as good.

The swab for obtaining the membrane for inoculating the tubes is preferable to the inoculating needle, as the infected areas can be quickly passed over, and the secretions are readily gathered in the meshes of the cotton. Besides, the operator is not exposed so long in front of the patient.

The serum-tube may be brought to the bedside and inoculated at once after the swabbing of the throat, or the swab can be returned to the sterile tube and taken to the laboratory and the inoculation made there, and the serum-tube placed at once in the incubator.

A few words as to the method of obtaining the infective material from the throat and inoculating the tubes may not be amiss. With the patient in a strong light, the operator puts one hand on the patient's head, grasping the head firmly so as to control the movements of the patient should he cough, while with the other he holds the tube containing the serum. An assistant depresses the tongue, and with the other hand holds the tube containing the swab. The operator removes the swab and rubs it firmly but gently against any visible membrane, either on the tonsils, pharynx, or uvula. It is advisable to make two tube inoculations, one from the well-formed membrane, the other from the ulcerated or oozing surface. The swab can now either be placed back in its tube, and the extending cotton singed and the whole be taken to the laboratory, or the serum-tube can be inoculated at once. After the swab has been used and the inoculation made, the cotton should be burned, while the steel rod can be again sterilized and used. Should no false membrane be visible the swab should be passed over the reddened mucous membrane. Should false membrane be present in the nose, inoculations should be made from it also. Inoculations should not be made for at least four hours after the application of disinfectants to the throat.

After the inoculation has been made, the serum-tubes are placed in the incubator and kept at a temperature of 37° C., the optimum temperature of the Klebs-Loeffler bacillus, for from ten to sixteen hours. After incubating the inoculated tube for ten or twelve hours the surface should be inspected, and as soon as the surface shows minute colonies, which spring up as almost pin-point elevations, a spread should be made. Great care must be taken not to spread the material too thickly on the cover-glass. This can be avoided by first placing a tiny drop of sterilized water on the cover-glass. The platinum needle is then introduced into the tube and swept over the colonies, and the bacteria adherent to the needle are washed off in the drop of water previously placed on the cover-glass, and evenly distributed over the entire surface.

The spread is then allowed to dry in the air, and before being placed in the stain is fixed by being passed quickly through the flame of an alcohol lamp. The spreads should then be stained with Loeffler's alkaline methylene-blue. The cover-glass is left in this stain without heating for from ten to fifteen minutes; it is then rinsed with distilled water, dried, and mounted in Canada balsam.

This brings us to the actual study of the individual inoculations. The cases are taken up separately. The report is mostly that of daily work in the laboratory, which was largely routine, being the examination of the inoculations made from day to day. As to proving in each case that the germ found was Klebs-Loeffler's germ, and virulent, inoculation of guinea-pigs would have been necessary. To do this with each daily inoculation would have been scarcely possible, at least not necessary, the standard germ being one which had been demonstrated beyond doubt to be Klebs-Loeffler's by producing the disease in animals. This was not necessary in two of the cases under observation, as they died of the disease. Tubes containing blood-serum prepared after the manner described by Loeffler were used in each inoculation.

In the four cases studied stains were made from each tube inoculated as soon as the growth appeared, also second stains were made after a few hours which show more markedly the growth of other germs. The stain used was Loeffler's alkaline methylene-blue. The slides were all examined by Leitz $\frac{1}{12}$ oil immersion No. v. eye-piece.

CASE I.—F. N. (8668.) This case was examined by Dr. W. M. L. Coplin before injection with serum, and the Klebs-Loeffler bacillus was found in great numbers. The case was injected with serum, November 5th. Forty hours after injection a tube inoculation was made, which was incubated as described above, and after twelve hours a characteristic growth appeared. Stains from this showed many large Klebs-Loeffler bacilli, some showing the pole granules or refractile bodies, others showing small bacilli, rather pointed; a few streptococci were present, the Klebs-Loeffler presenting the same appearance. Stains made November 8th showed the Klebs-Loeffler bacillus more irregular and present in greater numbers, with increase in the number of streptococci, while the staphylococci remained about the same. Slides made November 10th showed an increase in the number of Klebs-Loeffler germs in the field as compared with other germs present on second stain; yet the first stain made from the tube showed nothing different from stains made November 8th. On November 10th the patient died. Total tube inoculations, six. Total stains made, thirty-six.

CASE II.—A. J. (8678.) Tube inoculations were made before injection with serum, November 5th. After incubating for sixteen hours, stains were made which showed the characteristic Klebs-Loeffler bacillus with few staphylococci. Later stains showed many cocci as well as the Klebs-Loeffler bacillus in large numbers, but somewhat irregular. Inoculations were made from this case as follows: November 7th, 8th, 10th, 11th, 12th, 13th, 15th, 16th, 17th, 18th, 19th, 21st, 23d, 24th, and 25th. It is not necessary to burden the reader with a description of each tube and slide; a statement of the general characteristics of the slides as the case progressed will suffice. On November 7th the slides showed very little difference from those made November 5th, except slight irregularity in the Klebs-Loeffler; on November 8th stains showed the beginning irregularity of the Klebs-Loeffler bacillus, many large and small, yet each showing some form of the germ. The cocci showed nothing different. No streptococci present.

November 10th, 11th, 12th, 13th were much the same, the Klebs-Loeffler bacilli being fewer in number, less irregular than in the earlier slides or in the other cases, and the cocci present in increased numbers, that is, by comparison. By some the irregular forms of the Klebs-Loeffler bacillus would possibly be described as another germ, but by closely watching the growth, and by isolation from the first growth appearing, the pure culture obtained showed the same characteristics. November 15th, 16th, 17th, and 18th showed practically the same, differing from the earlier tubes in that the Klebs-Loeffler was larger in size, showed the peculiar dumb-bell shape, some showing the refractile bodies, the germ being very irregular as to size and shape. A few bacilli somewhat resembling the Loeffler bacillus were present, but they did not present the characteristics. Stains from tubes inoculated November 19th, 21st, and 23d showed many cocci present, but fewer characteristic Klebs-Loeffler bacilli, also short rod-like bacilli which presented no characteristic appearance of being Klebs-Loeffler, either in appearance or by stain. The Klebs-Loeffler bacilli were markedly irregular and difficult to stain. Stains made November 24th and 25th showed few Klebs-Loeffler bacilli, which were not so characteristic, and only an occasional one found present in the field. Many other non-characteristic bacilli were present as well as numerous cocci. Total

CASE A.

Fig. 1

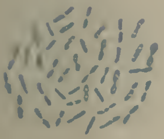


Fig. 2.

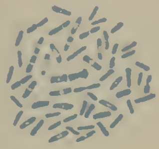
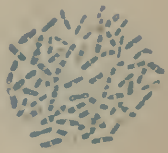


Fig. 3.



CASE B.

Fig. 1

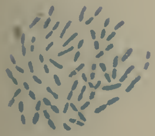


Fig. 2.

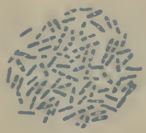
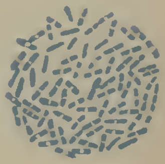


Fig. 3.



CASE C.

Fig. 1.

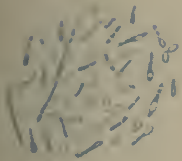


Fig. 2.

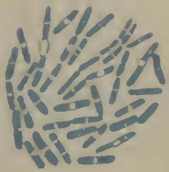
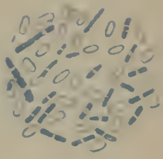


Fig. 3.



number of tubes inoculated, seventeen. Total number of slides stained and examined, one hundred and ten.

CASE III.—B. M. (8612.) Tube inoculations were made on November 5th, before the patient was injected with serum. After incubating for twelve hours spreads were made and stained. The field showed both strepto- and staphylococci, a short plump bacillus which tended to arrange itself in parallel rows, also the characteristic Klebs-Loeffler bacillus with its rounded ends, some swollen at one end, some at both, and some swollen in the middle, others presenting the refractile bodies. Stains made forty hours after the injection with serum showed on first and second stain the following: The number of cocci were increased as well as the number of short, thick, and deeply stained bacilli, while the Klebs-Loeffler bacilli were diminished in number and most markedly irregular as to size and shape; also more difficult to stain. Test-tube inoculations were made in this case as follows: November 7th, 8th, 10th, 11th, 12th, 13th, 15th, 16th, 17th, 18th, 19th, 21st, 23d, 24th. Stains made from tubes inoculated on the 8th and 10th showed considerable alteration in appearance from those made from tubes inoculated on the 7th, the slight alteration being on the 10th; the Klebs-Loeffler were slightly increased in number and more uniform; the cocci and short bacilli about the same. Stains made from inoculations made on the 11th, 12th, 13th, and 15th, showed nothing markedly different from those made on the 10th, except the presence of what I believe to be the *monilia candida* and a more irregular formation of the Klebs-Loeffler bacilli, yet they still presented their characteristic features. Stains made from the tubes inoculated on the 16th, 17th, 18th, and 19th showed gradual diminution in the Klebs-Loeffler bacilli. The germ showed irregular forms, many with swollen ends and many showing pole granules. The small thick bacilli increased in number from the 18th to the 21st, few streptococci, but many large and small staphylococci, many monilia candida present. Stains from tube inoculation made on the 21st, 23d, and 24th showed practically the same, except the gradual diminution of the Klebs-Loeffler bacilli with the irregular forms, yet there still could be found in every microscopic field some characteristic germs. Total tube inoculations made, sixteen. Total stains made, ninety-six.

CASE IV.—J. H. (8689). This patient was injected with serum on November 9th. Stains from tube inoculation which was made before the injection showed as follows: From the first growth appearing the field was filled with characteristic Klebs-Loeffler bacilli, regular in size and shape, and few strepto- and staphylococci. Stains made a few hours later showed no diminution of the Klebs-Loeffler germ, but increase in the cocci, especially the streptococci, with a few non-characteristic bacilli. Stains made on the 10th showed increase in the non-characteristic bacilli, the cocci presented the same appearance, while the Klebs-Loeffler bacilli showed marked alteration in form, but no diminution as to number. Stains made on the 11th and 12th showed the same, while those made on the 13th and 15th showed an increase in the number of Klebs-Loeffler bacilli, although they were somewhat irregular. On the 15th the child died. Total tube inoculations, 6; total number of stains, 36; total tube inoculations from four cases, 45; total stains made and examined, 278.

From each tube, after from six to ten days, second stains were made which in each case showed a diminution of the Klebs-Loeffler bacilli, with marked alteration, which alteration in form rendered the recognition of the germ almost impossible, with an increase in the non-characteristic bacilli and also of the cocci. This diminution and alteration in the Klebs-Loeffler bacilli was most marked in the tubes which contained no streptococci. Two cases were studied in which no serum was used. The tube inoculations were made at intervals to correspond with those made from the cases in which the serum was used. One case died after four inoculations, while the other improved, and the experiments were carried on at a length of time to correspond to the serum cases. These showed the characteristic germ present, yet from day to day they did not present such marked alteration in appearance as those from the serum cases, the Klebs-Loeffler bacilli remaining more uniform in appearance until after the disappearance of the membrane, when the non-characteristic germs were more numerous, cocci increased, and the Klebs-Loeffler diminished and more irregular. Stains made from the tubes of mixed growth of six days showed much the same as in the serum cases.

Conclusions.—The recognition of the bacillus of true diphtheria is somewhat difficult, owing to its resemblance to the germ described by Hofmann, yet I believe with others that with a careful examination of the bacterial growth in a blood-serum tube, which tube has been carefully inoculated according to the rules given above, then kept at first at a temperature slightly below the optimum, and yet not the minimum, for a few hours, then gradually brought up to the optimum and retained at that point for six or eight hours, then gradually lowered to about 32° C., the microscopic examination can be without doubt relied upon.

Roux and Yersin have shown that now and then bacilli from cases which clinically are diphtheria, and which show the Klebs-Loeffler germ, may possess little or no virulence; moreover, they also say, as quoted by Sternberg, "it is then possible by commencing with a virulent bacillus of diphtheria to obtain artificially a bacillus without virulence, quite similar to the attenuated bacilli which may be obtained from a benign diphtheritic angina, or even from the mouth of certain persons in good health. This microbe, obtained artificially, resembles completely the pseudo-diphtheritic bacillus; like it, it grows more abundantly at a low temperature; it renders bouillon more rapidly alkaline; it grows with difficulty in the absence of oxygen."

As to the significance of whether it is the Hofmann germ or Klebs-Loeffler much has been written, and authors differ widely in their views. Personally I believe that the degree of resistance on the part of the patient has much to do with the variance in the germ. If in one case the Klebs-Loeffler germ fails to produce the disease when inoculated into animals, or the Hofmann's germ in one case causes the disease, it matters little in the care of the case whether it be the true or false germ—if there is a difference. Loeffler himself found the Klebs-Loeffler germ present in the case of a perfectly healthy child. Was the germ found virulent? Was it the germ of true or false diphtheria, or was it the resistance on the part of the patient, the healthy secretions of the mucous membranes, which lessened the virulence of the germ. In a certain number of cases which clinically are diphtheria the first inoculations may fail to show any Loeffler bacilli, yet a second inoculation made in a few hours will show many characteristic germs. It must be remembered that in each lot of test-tubes of culture media there are always some tubes in which no growth of any germ will develop. This is not the fault of the bacteriologist, but is due to the action of a material which forms within the tube, due to changes produced by excessive heating. What this material is has not been demonstrated, yet that it renders the culture media inert there is no question. Barring this one source of error, I think when the germ is not found in cases which are clinically diphtheria that the fault is on the part of the bacteriologist. It will be seen in the report of the cases in which the serum was used, that forty-eight hours after the injection of the serum the character of the germ was altered, yet it is not claimed that the antitoxine serum has any action directly on the germ; but by counteracting the poison in the system, produced by the product of the germ, the resistance on the part of the patient manifested at the nidus of infection indirectly affected the germ's nutrition, thereby altering its character. This is true, providing the previous products have not caused pathological alteration in tissue structure; in such cases it is not possible for the serum to effect such alterations. At one time it was thought by some observers that the size of the germ had to do with its virulence. It is now conceded by most observers that the size and length of the germ have nothing to do with its virulence. Certainly in these cases studied, which clinically were most severe in character, no definite conclusion could be made from the appearance of the germs. They were irregular in size in each case. Strepto- and staphylococci live long in the throats of healthy individuals without causing any disturbance so long as the mucous membranes are healthy; but under certain conditions, as when the mucous membrane's resistance has been lessened by exposure to cold or other deleterious influences, or by the poison of scarlet fever or other infectious diseases, the streptococci alone or associated with other germs attack the mucous membranes and cause inflammation; it has been shown that when there are cases of scarlet fever in the same institution, the Klebs-Loeffler bacilli may be found in the pseudo-membrane forming in such cases.

It is a well-known fact that environments alter the characteristic features of all germs; that in the description of a germ, temperature, light, culture medium, and absence or presence of other bacteria must be taken into consideration. Also that laboratory germs which depend on artificial nutrition differ somewhat from those found in the body; this is especially true of the bacillus of diphtheria, which is demonstrated by the difference in description given by various authors; the alteration of the Klebs-Loeffler bacillus, as due to the age and conditions under which the germ was found and grown, may be shown in the following plates, the legend explaining the growth. The germs were subjected as nearly as possible to the same conditions, all being grown on Loeffler's blood-serum, except Case C, Fig. 1.

Case A, Fig. 1. Tube inoculated before serum injection. The diphtheria bacilli are seen as irregular staves, dumb-bell shape, with refractile bodies at the poles, and unevenly stained staves, the poles staining intensely while the central portion is pale. (Eye-piece iv., Beck objective $\frac{1}{12}$ ol. im. Leitz.)

Case A, Fig. 2. Tube inoculated forty hours after serum injection. The diphtheria bacilli have lost some of their irregular form; though still markedly irregular, some are now seen as short staves which stain intensely at the poles.

Case A, Fig. 3. Tube inoculated five days after tube 1. The bacilli are larger and more irregular than in tube 2, though they show otherwise the same characteristics.

Case B, Fig. 1. Tube inoculated upon the admission of patient. No serum was used. The diphtheria bacilli are slightly irregular in form, though the larger number are small staves staining intensely at the poles.

Case B, Fig. 2. Tube inoculated forty hours after admission. The diphtheria bacilli are smaller and more regular in form than the preceding. They stain intensely at the poles.

Case B, Fig. 3. Tube inoculated five days after admission. The diphtheria bacilli are slightly larger than in tube 2, otherwise they appear the same.

Case C, Fig. 1. From agar-agar tube of Klebs-Loeffler bacillus six months old. The bacilli are shown as irregular staves, staining unevenly. The staining is quite intense at the poles. In some few of the bacilli one end is greatly enlarged. There are present, also, a large number of ovoidal bodies which stain only at the periphery.

Case C, Fig. 2. Tube 2, inoculated from tube 1, growth forty-eight hours old. Irregular staves, staining for the most part very unevenly. The bacilli seem to tend to the formation of short chains. Few ovoidal bodies are present.

Case C, Fig. 3. Tube 3, inoculated five days later from tube 2. The bacilli closely resemble those in tube 1, though the ovoidal bodies are not so numerous.

It will be seen that the most marked change occurred in the bacilli from the serum case and from the old culture. In many slides presenting the irregular involution forms it would be difficult to distinguish many of the germs from the germ described by Hofmann.

If, when the germ is grown on different nutrient media its form is so markedly altered, certainly we must grant that in different individuals the germ would be placed under equally as great variations in nutrition, besides the resistance on the part of the patient.

From the drawings made from the stains which were made from growths subjected as nearly as possible to the same conditions, it is quite clear why it is so difficult to distinguish the *true* from the pseudo-diphtheritic bacillus. It is impossible to differentiate microscopically.

That the Klebs-Loeffler bacillus exists in the throats of healthy individuals who have been exposed to diphtheria has been demonstrated by many observers. It may be interesting to note that in tube inoculations made from the throats of individuals exposed to diphtheria while examining the cases in the hospital ward, the characteristic Klebs-Loeffler bacilli were found; the virulence was not tested.

All bacilli found in cases which are clinically diphtheria, which bacilli are identical with the Klebs-Loeffler bacillus, should be classed with the diphtheria bacillus, even if their virulence has not been tested on guinea-pigs, or even if tested and little or no virulence is shown.

In three cases streptococci were found. Two of these cases proved fatal; one in which a few were found recovered. One thing noticeable was the absence of other germs besides those mentioned, which was practically the case when the Klebs-Loeffler bacilli were present in large numbers.

I am indebted to my laboratory assistants for their help in these investigations.

REVIEWS.

A TREATISE ON THE PRINCIPLES AND THE PRACTICE OF MEDICINE. Designed for the Use of Practitioners and Students of Medicine. By AUSTIN FLINT, M.D., LL D., late Professor of the Principles and Practice of Medicine and Clinical Medicine in the Bellevue Hospital Medical College, New York, etc. Seventh edition, thoroughly revised by FREDERICK P. HENRY, A.M., M.D., Professor of the Principles and Practice of Medicine in the Woman's Medical College of Pennsylvania; Physician to the Philadelphia Hospital; Corresponding Member of the Royal Academy of Rome, etc. Philadelphia: Lea Brothers & Co., 1894.

THE rapid changes in medicine and the multiplication of text-books characteristic of the present day leave almost no time for the study of older masterpieces of our art. This is especially true of undergraduates, who, for many reasons, will have only the latest imprint. The attention to the work which a new edition of *Flint's Practice* is sure to produce is, therefore, a source of congratulation, for the student or physician who has not read at least a large part of *Flint* has much to live for.

In bringing out a work on Practice eight years after the author's death the question would naturally arise whether to republish the copy last prepared by the author or to make such changes as might reasonably be supposed he himself would have made. Although something could be said in favor of the former, it can hardly be doubted that the plan adopted is that which will secure the widest circulation of the work, and that is doubtless the wish of all who know it.

Editing being desired, the choice of an editor would be the next consideration, and the selection made in this case must be pronounced an excellent one. By experience as a clinical investigator, writer, and teacher, Dr. Henry has shown himself an able disciple, and his attitude to the work is shown in brief but well-chosen words in the preface. We shall consider later Dr. Henry's additions; in the meantime we wish to speak of the work as a whole.

The greatest change made, the omission of the chapters on general pathology, does not affect the work of Dr. Flint, and, useful as those chapters were when the older editions were new, we think few will differ with Dr. Henry in regard to the propriety of leaving them out now. This, however, brings up a point of interest. In the older editions the table of contents was divided into two parts—one on "General Pathology, or the Principles of Medicine," and one on "Special Pathology, or the Practice of Medicine." To be sure, Dr. Flint explained that he would not treat "of topics belonging to general pathology exclusively in the first part of the work," but the headings were perfectly arbitrary. General pathology includes only a part of the "principles" of medicine. "Practice of medicine" is not limited to special pathology, so that the idea which might arise, that the present edition should be called merely "Practice of Medicine," is, as far as the contents are concerned, not reasonable. It is not a little curious to see how, in the lifetime of a generation, text-books on medicine have lengthened their titles and shortened their tables of contents. In fact, the work on the *Principles and Practice of Medicine*, which now takes the place formerly filled by Flint, has not so much as a preface or introduction in which to consider the general physiological, pathological, and other topics usually considered necessary by our fathers in books entitled merely "Practice of Medicine."

Text-books are useful documents in the history of medicine, and it is interesting to see in the classification of *Flint*, which was in many respects in advance of its time, the rapid strides of the "principles" of medicine. Flint's idea of classification was the only correct one—that is, that its chief object was convenience. Convenient this one still is, but the title, "General Diseases," is already out of date. The specific infectious diseases fall naturally in the old list of general diseases (the placing of leprosy among the eruptive fevers seems to have given the editor some difficulty), but lithæmia, gout, and rickets seem to deserve a separate category. The changes wrought in a few years appear vividly when one reads the classification and the remarks on causation concerning many of the "general diseases." How recent are the changes by virtue of which we no longer speak of general diseases, except in the sense of *lucus a non lucendo!* No longer do we need to assume that pneumonia, erysipelas, diphtheria, etc., are "essential fevers" due to an affection of the whole body at once. The knowledge we have now on the subject of infection, localized in the beginning, or always, with "general" *symptoms* as the result of complicated processes following the infection, incomplete as it still is, is an enormous step in advance.

We are far from wishing to intimate that the editor should have changed the classification. That would have affected the physiognomy of the work too much. Moreover, *Flint* should be read not for such transitory things as classifications, etiology, speculations on pathogenesis, etc., but for the living and speaking pictures of disease he has given us, that we may profit by his close and systematic observation, his accurate reasoning, his candor in regard to his own opinions, and his receptivity for others as knowledge increased, and, not least of all, for his conservative and wise views regarding treatment. The value of Flint's opinions on the latter subject is so great that it is unfortunate they have not been more widely followed by the profession in this country.

The editor's additions are, as a rule, admirable, being in clearness and conciseness much like the original text. The only radical alteration is in the section on diseases of the stomach, and the new chapters are among the best in any text-book. The new topics included by the editor are also handled in a masterly way.

In some instances revision and addition might have gone further. Thus, the application of the older accounts of the pathological anatomy of dysentery to the disease in this country is no longer necessary; the account of sporadic cholera might have been altered with advantage; the causation of cerebro-spinal meningitis could have been revised with profit. The statement on page 510, that no cases of ankylostomiasis have been described as occurring in the United States, should be altered by reason of the interesting observation of Blickhahn (*The Medical*

News, December 9, 1893). The mechanical execution of the work is good; the proof-reading, as a rule, excellent. We have noticed Baccelli spelled twice on page 962 with one c, although correctly printed on an earlier page. Cremona, page 972, for Carmona has come down from a former edition. The terminology of drugs illustrates the devious ways of our Pharmacopœia.

On the whole, the new edition can be warmly recommended to students and practitioners. G. D.

A Manual of Orthopedic Surgery for Students and Practitioners. By James K. Young, M.D., Instructor in Orthopedic Surgery, University of Pennsylvania. Octavo, 436 pages, with 285 illustrations. Philadelphia: Lea Brothers & Co., 1894.

It is a pleasure to review a new work on this subject, published in such a careful way, with good letterpress and excellent illustrations.

The writer has presented to the profession a compact and serviceable book not too large for the convenience of students, nor so small as to expose itself to the charge of superficiality. He has treated the subject broadly, including under the subject the topics of caries of the spine and diseases of the joints, most fruitful causes of deformities. Unlike, however, some of the foreign orthopedic works, there is no chapter devoted especially to apparatus. In this, perhaps, the Continental writers are wiser than the Americans; for although it would appear that in the American mind the ready application of the needed apparatus would come without much instruction, yet practical experience with teaching would be sufficient to convince the doubter that to both the practitioner and the student some attention to detail would be advisable. The writer adds greatly to the value of the work by his excellent chapters on paralytic diseases to be met in orthopedic surgery. These have been chiefly treated extensively by the neurological writers, who have paid attention to the scientific side of the subject but have neglected the practical question of providing means of locomotion when the restoration of power or of strength to an enfeebled muscle is no longer possible. This is of course a matter of much importance to the patient, and also in the development of muscle, for protected exercise is an excellent muscular stimulant.

Dr. Young has combined in his articles on Paralytic Deformities the evidence of the study of a trained observer of neurological facts and also experience in the mechanical application of apparatus advisable in such deformities. The writer has also taken a broad view of his subject, believing that orthopedic surgery should consist not only in the application of apparatus, but in such operative measures as are useful, efficient, and to be relied on in curing quickly and thoroughly.

There are but few criticisms to be made of the work.

On page 54 the illustration of the antero-posterior support is credited to Goldthwait, when it is a modification of the apparatus recommended by Blanchard. In the article on hip-joint disease the treatment by fixation is termed the English method, although it is more thoroughly carried out in France, and was first, if we remember, introduced by Bonnet. The Thomas hip-splint can hardly be called "the most per-feet type of a pure fixation splint," as the author does; it is perhaps the most practical means of furnishing a modified fixation. We object to the term, "the American method," applied to traction, although this is often done. This objection can be made on the fact that geographical distinctions are not useful in therapeutics, as new ideas spread and the American methods may become soon universal.

The writer says that it is highly probable that separation of joint surfaces in hip disease is seldom or never attained, and again that a distracting force sufficient to separate the head of the bone from the acetabulum is neither necessary nor desirable. We are inclined to think that these statements are hardly in accord with later investigations. In hip disease it certainly would be advisable (if it be feasible) to separate the head of the bone from the acetabulum; that it can be done with proper attention we think is also proved; that it is rarely done is perhaps due to the fact that the matter is not so thoroughly looked after by the surgeon as is desirable. The illustration of a case of ankylosis of both hips with subcutaneous osteotomy below the trochanters before and after treatment hardly shows so good a result as can be obtained, and would not encourage the beginning surgeon in his first attempt. We are glad to see that the writer recommends tenotomy in cerebral paralysis; he is thoroughly justified in so doing by the clinical facts, although the method has been opposed by many neurological writers.

In the article on Club-foot sufficient value is not, it seems to us, placed upon the apparatus used by Taylor; the modification presented by Judson is of value, but is not so efficient as that used by Taylor. The latter, however, requires much attention to detail, and it is for that reason that it is not given. The illustration on page 398 of Judson's walking brace is erroneously called an apparatus for equino-varus; the apparatus depicted is for calcaneus.

In Flat-foot sufficient attention has not been paid to plates recommended by Dr. Whitman, of New York.

The article on Congenital Dislocation of the Hip is of value. The author, however, mentions a "cure" by the treatment by traction, reported by Bradford; instead of the word cure, "improvement" would perhaps be better, as the case as reported was under observation at the time of the report; ultimate results were not mentioned.

In conclusion it may be said that this last work on orthopedic surgery is not only a credit to the writer but of great practical value, and in many respects the best work within the reach of the student and practitioner in this growing branch of surgery. E. H. B.

THE PRINCIPLES OF BACTERIOLOGY. A Practical Manual for Students and Physicians. By A. C. ABBOTT, M.D., First Assistant, Laboratory of Hygiene, University of Pennsylvania, Philadelphia. Second edition, enlarged and thoroughly revised. With 94 illustrations, of which 17 are colored. Philadelphia: Lea Brothers & Co., 1894.

IN the past few years many books have been written in the comparatively new field of bacteriology. Some are exhaustive but not practical, others practical but not sufficiently exhaustive. In this book the author has presented the subject clearly and concisely; it is a practical bacteriology by a practical bacteriologist. In this edition much has been added; while the first edition was commended for its absence of drawings of germs, which are often misleading, the addition of such drawings to this edition is valuable and not calculated to mislead.

A sketch of the evolution of our knowledge of immunity and infection is a valuable addition, and presents clearly the whole subject in a few words. Necessarily all books are more or less compilations, yet the reading of the author's own views presented in his own original way of writing, even if adverse to our own views, always demands commendation. A word of criticism can be offered as to a little carelessness as to solutions; on page 65, for cleansing test-tubes, etc., a 2 per cent. soda solution is referred to: there are a number of soda combinations, and while it may be clear enough to one familiar with laboratory technique, yet the student will instantly ask, "Which soda solution?" As the book is intended for laboratory work the index should have been more complete.

The publishers deserve credit for the manner in which the book is printed and bound. D. B. K.

NEURASTHENIA, AND ITS TREATMENT BY HYPODERMATIC TRANSFUSIONS. By RALPH BROWNE, L.R.C.P. Lond., M.R.C.S. Eng.; Physician to the Chelsea, Brompton, and Belgrave Dispensary, etc. Pp. 56. London: J. & A. Churchill, 1894.

THIS little book is a *résumé* of the work of Dr. Jules Chéron, and in four chapters treats of transfusions in general, stating that the particular one discussed here is composed of sodium chloride, phosphate, and sulphate in solution; hypodermatic transfusions; neurasthenia, and the mode of action of hypodermatic transfusions. As a standpoint for rational therapeutics pathogenic theories—the chemical of Bouchard and the nervous of Beard—are cited. The physiology of the transfusions is briefly given. The interesting and important questions of *technique*, composition, and contra-indications are entirely omitted. Although the book is based upon practical work extending over eight years it is written in terms so indefinite that it is of but little use to the practitioner beyond the suggestions which it contains. The subject is summed up in the statement that these transfusions "not only bring into action but maintain in function the great reflex of general tonicity; increasing the power of that function with each transfusion, up to the point when arterial tension has arrived at the normal level and stable conditions which are consistent with health." R. W. W.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

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DIPHTHERIA ANTITOXINE.

MR. HUNTER URQUHART WALKER reports a single case. He made use of the Behring solution, which contains to 2 to 2.5 per cent. of egg albumin and 0.4 per cent. of tricresol for preservative purposes. For the immunization of adults and older children fifteen drops of the solution is injected subcutaneously by means of a Pravaz syringe, which has been previously sterilized by alcohol, and 3 per cent. of a carbolic acid or 1 per cent. of a tricresol solution. For young children up to two years the dose should be one-half of the quantity. To persons who are threatened by diphtheria at least ten times as much is required to render them immune. The patient was a girl of eight years of age, who had been ill for a day or two before being seen. After three days' treatment with iron and potassium chlorate internally, and the constant use of lime-water spray, the membrane was well formed, even extending well over the soft palate and hanging down into the mouth. Eleven minims of antitoxine was injected into the forearm, with strict antiseptic precautions. The temperature at that time was 103° F., and the pulse 140. In four hours there was no fever, and the pulse was quite quiet; it was necessary to rouse the patient to receive nourishment, which throughout consisted of beef tea, chicken soup, brandy and milk, and wine whey. On the following day the same improvement continued, although the membrane was still present; it was apparently loosening on the right side. During the day much of the membrane came away. On the next day the membrane had entirely disappeared, the temperature was normal, and the pulse good; there was no pain. The injection was entirely innocuous, being followed by neither local nor general disturbance.—*The Lancet*, 1894, No. 3710, p. 791.

MR. ATHEL T. SAW reports six cases upon which the operation of tracheotomy was performed, which upon admission to St. Mary's Hospital were apparently cases of ordinary severity. No antiseptics were applied to the pharynx, but the wound was sprayed with a 1 to 1000 solution of corrosive mercuric chloride. The ages were eleven, seventeen months, five, five and one-half, six, and seven years; the first was fatal. After the fourth or fifth day the membrane, which previously had come up abundantly through the wound, ceased, and the wound was allowed to close. In none of the cases did the wound become unhealthy, neither was there any cellulitis of the neck, although on two occasions the neck showed signs of swelling on the morning after the operation. By the third or fourth day after the operation the patients' general condition had completely changed; they were bright, took interest in their surroundings, and played with their toys. The fatal case was moribund when admitted, the operation was performed without an anæsthetic, the patient not stirring, and death occurred on the following morning. On necropsy it was found that the membrane extended into the secondary divisions of the bronchi. The previous twelve months' mortality in tracheotomy for laryngeal diphtheria was 30 per cent. In twelve years no child under two years of age had been saved. Aronson's antitoxine in ten minim doses was injected, with antiseptic precautions, subcutaneously at twelve-hour intervals for three days. In no case was there inflammation at the seat of the injection.—*The Lancet*, 1894, No. 3711, p. 851.

Dr. A. MacGregor reports one case. A boy of ten years, ill for two days, was found to have the left tonsil covered with a greenish-gray membrane, with marked glandular enlargement at the angle of the jaw on that side. Fifteen minims of the tincture of ferric chloride was given every four hours and the throat brushed every hour alternately with boric acid in glycerin, 1 to 8, and strong Condy's fluid and water. Port wine and brandy were given freely. During the next two days the membrane continued to spread until it covered the tonsil, half of the pharynx, the soft palate, and the uvula. The pulse was 120, the temperature 99° F.; the breathing was labored, there were no laryngeal symptoms; his aspect and general condition indicated rapid collapse and death before many hours. Schering's serum was used, fifteen minims injected into the muscles of the back. Relief followed quickly, and convalescence was established in nine days.—*The Lancet*, 1894, No. 3714, p. 1027.

Mr. Ernest Hart states that there is a fairly complete record of thirty-six English cases within the past three months, with two deaths. It is impossible to run over this record without being strongly impressed with the fact that we have in diphtheria antitoxine a substance which has a marked influence on a most serious and fatal disease. What is now wanted is a standard preparation. So far it would appear that the exact dose is not a matter of extreme nicety; but it is difficult to believe that a substance capable of so modifying the susceptibility of the body to the diphtheria toxin will not have also considerable effect in other ways. Both for the sake of economy and safety no more should be used than is necessary, and a standard preparation ought to be available. It would be a great scandal were the market to be flooded with competing brands of such a substance, produced by different firms, at "cutting" prices; and if the public, when in peril from diphtheria, were to be exposed to the added danger of being infected with bad antitoxines.—*The British Medical Journal*, 1894, No. 1764, p. 889.

M. Martin after giving briefly the method of preparing the antitoxine and the *technique* of its injections, presents certain facts in regard to its employment. It probably does not act injuriously upon the kidneys; but, on the other hand, it appears to protect them against the diphtheria poison; while in two-thirds of the cases of benign diphtheritic angina albumin was found; in the same anginas treated by antitoxine it did not occur in more than one-half of the cases. As for local treatment, it is not necessary to employ it when the antitoxine is used. Inasmuch as corrosive mercuric chloride destroys the diphtheritic poison, it may, perchance, destroy the antitoxine, and thus the bad results with local treatment may be accounted for. Roux has used equal parts of menthol and powdered camphor, which liquefy on mixing, and so are easily prepared for application. However, no local applications are excluded save those which interfere with the action of the antitoxine, of which corrosive mercuric chloride is mentioned above, and phenol is the second.—*Le Progrès Médical*, 1894, No. 42, p. 249.

The Treatment of Pneumonia.

Dr. D. J. Leech believes that the statistics of pneumonia do not prove the value of any one treatment. Excessive bleeding and excessive doses of antimony lead often to increased mortality. The great value of a purely expectant treatment has not been found, though there is reason to think that under certain conditions the natural mortality of pneumonia is, for a time, extremely small. The employment of cold in many cases seems to be beneficial, and there is certainly good evidence that it has not the evil influence which has by many been feared from its use. It is probably that veratrum possesses considerable value in the treatment of some forms at least of pneumonia. We cannot at present accept Petresco's rosy views of the general value of digitalis, yet we may conclude that, under certain conditions, its exhibition in larger ones is desirable; and that such doses do not have the lethal effect in pneumonia which our knowledge of the effects of the drug under other circumstances has led us to fear. A consideration of statistics teaches us that there is not any single remedy for pneumonia, and renders it probable that remedies very opposite in character may, under different conditions, do good. We may surely hope that with the aid of increased knowledge as to the effects of remedies, which exact observation must give us, the time will come when we shall not have to report a hospital death-rate from this disease of one in 3.2 to 3.9 in those over fifteen years of age.—*The Medical Chronicle*, 1894, No. 1, p. 12.

Calcium Chloride in Pneumonia.

Mr. D. M. Moir is convinced that this drug when given in full doses has the effect of reducing temperature, and of keeping it reduced, in certain inflammatory diseases of the lungs. Crombie has shown that in lobar pneumonia (1) calcium chloride reduces the temperature and keeps it within safe or normal limits in spite of the continuance of the physical signs; (2) that there is a tendency for the morbid process to be arrested at whatever stage the drug is given in efficient doses, and that the course of the disease is thus shortened or rendered milder; (3) that there is a singular freedom from all anxiety, distress, and danger, a freedom not usually associated with continuous high temperatures; (4) and that there is a corresponding reduction in mortality. Two cases are reported. The amount of the drug used is from sixty to ninety grains *per diem*, dissolved in water, in from ten to fifteen grain doses.—*The Practitioner*, 1894, No. 317, p. 343.

PULMONARY TUBERCULOSIS CURED BY POTASSIUM CANTHARIDINATE.

DOTT. GENNARO PETTERUTI reports two cases in which a complete cure resulted, and a third which showed a notable improvement in nutrition and in general condition, so that for two years he believes himself cured, and reports for observation only at special request. The changes in nutrition, appetite, and urinary findings are those which have been described. As for the bacilli, the number found in the expectoration increases during the first fortnight of treatment, that is after the first seven or eight injections, and then returns to the quantity previously found. On the discharge of the patient from the hospital still a small number are found. The solution which is used is composed of cantharidine, 2; potassium hydrate, 4; dissolved over a sand-bath, with water at 200° F.. and diluted with warm water to 10,000. The commencing dose is seven drops. Besides the patients received for five to ten minutes, three times daily, an atomization of sodium benzoate in four per cent. solution, and two teaspoonfuls thrice daily during meals of guaiacol in cod-liver oil, in the proportion of one to eighty. As this mixture becomes well borne the amount of guaiacol is gradually increased to five times the original amount. To the suggestion that the sodium benzoate and guaiacol may have contributed both results, the answer is made that these remedies given alone are ineffectual. The results obtained in these cases have persisted for three years.—*Il Policlinico*, 1894, No. 22, p. 501.

THE VALUE OF REPEATEDLY WASHING OUT THE STOMACH AT SHORT INTERVALS IN CASES OF OPIUM OR MORPHINE POISONING.

MR. L. P. HAMBURGER cites the case of a Chinaman who had taken the estimated quantity of 150 grains of opium at 10 A.M. At 5.30 P.M. the stomach was repeatedly washed out until there was reason to believe that there was there no longer any opium. A second lavage was made at 8 P.M., and a third at 11.30 P.M., a quarter of an hour before his death. The second washing came out colorless, although it gave fine alkaloidal reactions, but did not respond to the test for mercuric acid; the third, also colorless, gave good reactions. The first washing removed the ingested but unabsorbed opium, but the alkaloids found in the others could only have been detected through their excretion by the gastric mucous membrane. Repeated washings, then, to remove the alkaloids as fast as they are eliminated by the gastric mucous membrane must certainly be a life-saving process, whether the poison has been taken by the mouth or hypodermatically.—*Bulletin of the Johns Hopkins Hospital*, 1894, No. 42, p. 94.

MEDICINE.

UNDER THE CHARGE OF

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IS THE ABSORPTION OF PLEURAL EXUDATES HASTENED BY EXPLORATORY PUNCTURE?

F. JORDAN (*Pester med.-chir. Presse*, 1894, No. 25; *Centralblatt für innere Medicin*, 1894, No. 42) has noticed increased excretion of urine and rapid absorption of the fluid following exploratory puncture in four cases of pleurisy. He afterward observed similar results in fifteen cases, twelve of which were acute, and two chronic serous pleurisies, and one with hemorrhagic effusion. A similar observation had been previously made by Gerhardt. Jordan explains the diuresis as the result of increased absorption by the pleura caused by the traumatic irritation. The small quantity of fluid removed—one c.cm.—can hardly have a perceptible effect on the pressure. If these observations prove to depend on more than coincidence the customary aspiration with the hypodermatic needle must be looked on as a therapeutic as well as a diagnostic measure.

CIRCULAR ATHEROMA OF THE AORTA WITH SYMPTOMS OF STENOSIS AND INSUFFICIENCY OF THE AORTIC VALVE.

AUFRECHT (*Deutsches Archiv für klin. Medicin*, Bd. liii, p. 562) reports the following instructive case: A laborer of forty-four years was admitted to the hospital on account of dyspnœa, cough, and œdema of the feet. The heart was enlarged; the apex-beat three cm. outside of the mammary line; there was a systolic and diastolic murmur, the latter always present, both of them loudest in the aortic area. There was extensive pulsation over the heart, and capillary pulsation under the finger nails and on the forehead. Dyspnœa, cough, expectoration, at times bloody; albuminuria, and œdema, completed the picture of valvular disease. Death occurred after increasing dyspnœa and coma. At the autopsy the aortic valves were found intact. Just above the insertion of the leaflets was a ring-shaped area of atheroma, undergoing calcification, one and one-half centimetres wide. The parts of the patch corresponding to the common insertions of the leaflets projected into the lumen of the artery—the projection at the insertion of the right and posterior leaflets being as large as "the half of a small walnut." The rest of the aorta showed insignificant atheromatous lesions. In addition to these changes there were dilatation and hypertrophy of the ventricles, especially the left; hemorrhages of the pericardium; hemorrhagic effusion into the right pleural cavity; infarct and splenization of the lungs; congestion of the liver and intestines. The lesions found show the cause of the symptoms and indicate the existence of an actual insufficiency of the valve, notwithstanding the healthy condition of the leaflets. Aufrecht assumes that regurgitation occurred because the blood could not enter the sinuses of Valsalva in order to press the leaflets together, and he draws the following conclusions: 1. That the usual view of the cause of the second sound of the heart must be modified, as the sound may be absent even in case of normal condition of the leaflets, if the cause of the closure—the blood—is prevented from entering the sinuses. 2. That the most severe atheromatous lesions occur immediately above the aortic valve. Aufrecht is inclined to attribute this predilection to sudden pulls on the beginning of the aorta by the heart, as the result of blows, falling, especially falling on the feet, etc.

A CASE OF STAPHYLOCOCCUS INFECTION SIMULATING TYPHOID FEVER.

AN interesting example of the mimicry of disease is given by MANCHOT, in the *Jahrbücher* of the *Hamburger Staatskrankenanstalten*, Bd. iii. A man of forty-three years, who had been under treatment for a long time for diabetes mellitus, was suddenly attacked with pain and stiffness in the neck, and delirium. Some of the cervical lymphatic glands were enlarged, and the patient complained of pain in swallowing; examination of the pharynx was negative. The temperature rose for several days after the manner of a typhoid-curve; the pain in the neck disappeared; the patient became stupid; the spleen was enlarged. On the seventh day a roseolar eruption appeared, but disappeared in twenty-four hours. The urine contained albumin, sugar, and an increased amount of urobilin. There was constipation. A diagnosis of typhoid fever was finally made. On the tenth day the patient died. The autopsy showed absence of typhoid lesions. The enlarged spleen gave cultures of staphylococcus pyogenes flavus, and more careful examination showed a phlegmonous inflammation of the retro-pharyngeal tissue, due to the same coccus. The general septic infection had evidently proceeded from this.

THE TREATMENT OF DIPHTHERIA WITH THE ANTITOXINE.

IN an address recently delivered to military surgeons in the Institute for Infectious Diseases at Berlin, KOSSEL (*Deutsche medicinische Wochenschrift*, 1894, No. 43, p. 823) described the method of preparation and the mode of employment of the antitoxine of diphtheria prepared by Behring and Ehrlich. Animals are rendered immune to diphtheria by treatment, first with small, and then with gradually increasing doses of the poison of diphtheria injected subcutaneously. The poison is obtained by inoculating nutritive bouillon with cultures of diphtheria-bacilli, and, after the lapse of two or three weeks, destroying the bacilli by the addition of 0.5 per cent. of carbolic acid or 0.3 per cent. of tricresol. The bodies of the dead micro-organisms fall to the bottom, and the clear, supernatant fluid contains the poison in solution. Animals react to injections of the poison by manifesting fever, doughy swellings at the site of injection, and the development of the specific antitoxine. After each injection the antitoxine appears in the blood of the treated animal and in progressively increasing quantity. The injections are thus continued until the blood contains a sufficient amount of the antitoxine. This is determined by testing from time to time the activity of the blood as to its ability to neutralize a given amount of the specific poison. Thus, of a poison whose action upon guinea-pigs is definitely known ten times the minimal lethal dose, *e. g.*, 0.1, is mixed with varying quantities of the blood to be tested, for instance, 0.3, 0.25, 0.2, 0.15, and 0.1, and the five mixtures injected into an equal number of guinea-pigs. Then if the animal that received 0.3 of blood plus 1. of the poison fails to present abnormal manifestations, while that which received 0.25 of blood plus 1. of the poison presents a small infiltration at the site of injection, and that which received 0.2 of blood plus 1. of the poison presents a still larger infiltration that undergoes necrosis, and that which received 0.15 of blood plus 1. of the poison succumbs in the course of fourteen days, and that which received 0.1 of blood plus 1. of the poison dies at the end of two days with symptoms of acute intoxication, it has been determined that 0.3 of blood is necessary to completely neutralize ten times the lethal dose of the poison.

In order to establish a standard, a serum of definite activity is designated normal serum, and for this has been selected that of which 0.1 suffices to neutralize ten times the toxic dose of the poison, and the formula is made that 1 c.c. of normal serum contains one immunifying unit. Thus a serum of which 0.01 suffices for neutralization represents ten times the strength of normal serum, and 1 c.cm. contains ten immunifying units. It has been determined that for the cure of diphtheria in children at least 500 such units must be injected; that is, 10 c.cm. of a serum 50 times as strong as normal serum, or 5 c.cm. of a serum 100 times as strong as normal serum. When it has been determined that the blood of an animal rendered immune possesses the desired valuation a free bleeding is practised, the blood being received in a sterilized vessel and placed in an ice-chest until coagulation has taken place. The clear serum that is expressed is carefully removed, and to it 0.5 per cent. of carbolic acid is added. For the preparation of the serum, large animals, particularly horses, are preferable, because of the larger amount of blood that can be obtained.

If the diphtheritic process has involved the bronchi and the lungs, so that even tracheotomy would be of no avail, the period will have passed when favorable results may be hoped for from the institution of treatment with the serum. If to the diphtheritic process there have been added the complications due to secondary infection the antitoxine may help, but cannot be expected to cure. If, again, the disease has existed for considerable time, during which the body has been exposed to the action of the diphtheritic poison, the employment of the antitoxine may bring amelioration, but the prognosis must remain doubtful on account of the changes already induced in nerves, cardiac muscles, and kidneys. Nevertheless, the treatment should not be withheld in any case, because only good can result.

Governed by the principles laid down the mortality in the Institute for

Infectious Diseases, of Berlin, has been kept down to 16 per cent. Of all of the cases that came under observation upon the first and second days of the disease, not a single one was lost. The belief is expressed that every case of diphtheria treated early with a sufficient amount of antitoxine should recover. The employment of the serum is unattended with unpleasant complications. The influence of the agent may be observed in a hastening of the detachment of the membranes and in improvement of the general condition. A few hours after the injection, the temperature and the frequency of the pulse begin to decline, and in the course of twenty-four hours in cases treated early, the temperature and pulse return to normal. Subsequent elevation of temperature or acceleration of pulse is to be ascribed to complications. Only cases of true uncomplicated diphtheria are thus favorably affected. The injections have been made in the lower lateral portions of the chest below the axillæ, and it is well to gently manipulate the site of injection.

The serum is dispensed in three forms in a single dose. The first represents 600 immunifying units, and is to be employed in recent cases upon the first and second days of the disease. The second represents about 1000 immunifying units, and is to be employed in cases seen after the second day, or in cases of exceptional intensity seen upon the first and second days, or in cases of involvement of the larynx. The third represents from 1500 to 1600 units, and is to be employed in the case of adults or in severe and protracted cases in children. Should the selected dose prove insufficient it should be repeated, although it is preferable if possible to inject the desired amount at once and at the outset. As a prophylactic measure in children and others that have been exposed to infection, a quantity of serum representing about 150 units should be injected. The immunity thus conferred is but transient, and is not to be depended upon for a period longer than from two to three weeks; if it be desired to prolong this protection the injection should be repeated at the end of this time.

The Treatment of Cholera with the Blood-serum of Convalescents.

Freymuth (*Deutsche medicinische Wochenschrift*, 1894, No. 43, p. 829) has reported four cases of cholera, three of which were treated with blood-serum from convalescents from attacks of cholera. They occurred in a man seventeen years old, who had been sick twenty-four hours, in two women thirty-five and eighteen years old, respectively, who had been sick for six or eight hours, and in a man forty-five years old. All had subnormal temperature, and vomited incessantly. The stools had the characteristic rice-water appearance; the eyes were sunken; the nose pointed; the extremities blue, marbled, and cold; the skin elevated in folds; the pulse inappreciable; the voice hoarse and rough, with anemia, cramps in the calves, and jactitation. In the first case, warm applications; repeated subcutaneous injections of camphorated oil; the administration of ice and champagne; subcutaneous infusion of physiological salt solution were practised, but after the lapse of some twelve hours the young man succumbed. It was now concluded to treat the remaining cases with the blood-serum of convalescents from attacks of cholera, and two patients who had recovered four weeks before volunteered. The blood thus obtained, after standing twenty-four hours in an ice-chest, yielded 240 c.c. of clear serum, of which, in the second and third cases, 10 c.c. were injected subcutaneously upon the third day, 30 c.c. upon the fourth day, and 50 c.c. upon the fifth day. Death took place in the one case on the sixth day, and in the other 30 c.c. were also injected on the seventh day, and this case progressed to recovery. In the fourth case an injection of 20 c.c. upon the fourth day was followed by rapid improvement, which led to final recovery.

SURGERY.

UNDER THE CHARGE OF

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THE DANGER OF APOPLEXY DURING NARCOSIS IN ELDERLY PERSONS.

SENGER (*Deut. med. Woch.*, 1894, No. 37) calls attention to this danger during the narcosis of elderly people, especially in those cases where there is marked arterial sclerosis. He believes this accident has occurred in many cases where the diagnosis has not been made. He finds no such cases reported in anæsthetic statistics or in the literature at his command. The case reported is as follows: A patient, fifty-six years of age, suffering from sarcoma of the breast, had healthy kidneys and heart, and her pulse was normal, the arteries, however, showed sclerosis. During the anæsthesia there was no marked excitation, although there was some vomiting. Suddenly, while the face had been red, it became deadly pale and cold, the eyes fixed and expressionless, the pupils dilated and reactionless; the pulse could not be felt. The respiration, at first marked, became shallow and gasping, and then ceased altogether for a moment. Although the symptoms pointed to a centric and non-respiratory source of troubles, the author immediately began restorative measures, artificial respiration, external heat, and all the most approved means. After a short time the pulse and respiration again became normal, more chloroform was given, and the operation completed. When the patient recovered from the ether she complained of stiffness in the right leg and arm, and difficulty in speaking, which proved to be a partial hemiplegia of the right side, which had occurred during the narcosis. Clonic spasm followed after a time in the lower extremity, but not so markedly in the upper, while the patient complained of cold in the foot. After six days the motion returned in part to the arm, but there was a relapse; when the patient left the hospital there was still considerable lameness, the leg having been slower in recovering. Two years later the paralysis had mostly disappeared, the foot dragging only slightly. The author believes this danger is greater with ether than with chloroform, as the increased arterial pressure is sustained longer in the former, and that consequently in elderly people with sclerotic arteries chloroform should be the anæsthetic of preference.

The Regeneration of Osseous Tissue.

As the result of a series of careful experimental investigations and clinical observations, Criekx and van Engelen (*Journ. de Med. de Chir. et de Pharm.*, Ann. tome iii., fasc. 3 B., 1894) come to the following conclusions: 1. Sponges are of little value in producing regeneration; 2. Decalcified bone has been of some value; 3. The portion transplanted should be aseptic and the wound absolutely aseptic; the transplanted portion of decalcified bone not only hastens but also regulates osteogenesis. It serves as a support to the periosteal muff, preserves its form, and permits of the formation within it of a bone similar in shape and proportions to the original bone.

A Death from Œdema of the Lungs following Ether Narcosis.

Poppert (*Deutsche med. Woch.*, 1894, No. 37) reports a case of death after ether anæsthesia in a previously healthy man of forty-six years, who was operated on for an irreducible inflamed hernia. The operation disclosed an abscess cavity in the hernial sac, the radical operation was, therefore, postponed, and the cavity made aseptic and drained. The duration of the narcosis was about one-half hour, and the amount of ether used four-and-one-half ounces. It was administered by means of a Czerny's and then by a Julliard's mask, consequently it was not concentrated, and at no time was the patient very deeply under. The radial pulse was slow and regular, the breathing was deep and regular, vomiting of mucous occurred during the anæsthesia, and mucous râles were present at the end of the narcosis, though not very marked. The patient recovered consciousness quickly, there were no respiratory symptoms observable for the first hour after the anæsthesia, then, however, suddenly the breathing became difficult, loud bubbling râles were heard, and the patient had to cough up a large amount of thick mucus. The pulse remained normal, the patient was perfectly conscious, and it was thought to be only an excess of salivary secretion. The condition, however, became rapidly worse; despite the injection of camphor, the heart's action failed, the patient became more and more cyanotic, and a reddish froth came from the nose and mouth. Death followed, with these marked symptoms of œdema of the lungs, two hours after the end of the anæsthesia.

The post-mortem, made the same day, showed a fibrinous peritonitis with adhesions and suppurating foci, and an enormous œdema, especially of the lower lobes of the lungs. After a careful consideration of the condition found, the author ascribes the death to a post-ether narcotic œdema of the lungs. The study of this case, and the literature on this subject, leads the author to the following conclusions:

Death occurring during or after ether narcosis from œdema of the lungs is caused by the toxic action of the ether, as are also the majority of cases of post-anæsthetic bronchitis and broncho-pneumonia.

Death during anæsthesia is less frequent with ether than with chloroform, but the late deaths due to the anæsthetic are more frequent with ether.

Anæsthesia statistics should include late deaths as well as those during operation, especially all cases that cannot be accounted for by the disease present.

The statistics collected up to the present time (*i.e.*, Gurlt's) have not established the claimed superiority of ether over chloroform.

IMMEDIATE SUTURE OF THE BLADDER AFTER SUPRAPUBIC CYSTOTOMY.

AFTER discussing at length the literature and statistics on this subject, **TAILHEFER** (*Gaz. Hebdom. de Méd. et de Chir.*, August 12, 1894) concludes that primary union gives greater chances of quick recovery than after secondary union is attempted, and that the resulting cicatrix is scarcely distinguishable from the rest of the bladder wall, which cannot be said for the cicatrix following secondary union. Instead of exposing the patient to greater chances of infection, it makes the chance of urinary infection much less, even though it does not succeed, for it will hold at least for three days, and at the end of that time the inflammatory adhesion set up will prevent infection.

The only contra-indication to this form of operation is the presence, before operation, of hæmaturia, with the consequent tendency to the obstruction of the catheter by blood clots.

The preparation of the patient and method of operating he gives as follows: The use of salol by the mouth and boric acid injections *per urethram*, with attention to the general health.

The suture of the bladder should be made in two planes; the first passing between the muscular and mucous coats, a second layer of Czerny sutures to reinforce this.

The wound is drained at the lower angle, and a self-retaining catheter assures sufficient drainage of the bladder, or regular catheterization may be used, or the patient may be allowed to urinate; in the two latter cases the integrity of the urethral canal is necessary, as well as careful and intelligent supervision.

The after-treatment consists in attention to the catheter, washing it out with boric solution if it becomes occluded, or replacing it. The patient should be advised not to make any effort during urination, and, if he is allowed to urinate naturally, not to resist the desire to urinate. Rest in bed should be maintained until after complete cicatrization.

THE CORTICAL AREA, THE SUBCORTICAL TRACTS, AND THE CENTRE OF CO-ORDINATION FOR MASTICATION AND SWALLOWING.

RETHI (*Wiener Med. Presse*, 1894, Nos. 24 and 25) concludes, from a series of experiments upon dogs and the clinical observation of a number of cases, that by the stimulation of a cortical area, anterior to and to the outside of the motor area of the extremities, mastication can be produced, followed, as a rule, by the act of swallowing, which follows after a series of chewing motions, and that it is composed of a succession of co-ordinate synchronous movements, but not a single pure tonic contraction of the special muscles of swallowing. The movement can arise from stimulation of either hemisphere. The fibres through which chewing and swallowing can be stimulated pass from the cortical layer inward and downward through the lower portion of the internal capsule; in all these regions stimulation produces the same succession of movements. The centre of co-ordination of these movements has its location in the neighborhood of the optic thalamus, for after the destruction of this area there follows, from stimulation of the fibres lower down in the tract, contraction of the muscles of mastication without movements of the tongue or lips and without swallowing.

AN ADDITION TO THE TECHNIQUE OF MAJOR AMPUTATIONS.

CREDE (*Arch für klin. Chir.*, 1894, Band xlviii., Heft. 3) relates his experience in twenty-two major amputations which he had done within the past two years, and in which he obtained healing by true primary union in two-thirds of the cases. In the other cases healing followed, after slight local sloughing, within three weeks, except in one case in which there had been gangrene and septic infiltration of the tissues; here healing followed after four and one-half weeks.

Contrary to the general custom, this author makes flaps composed of both skin and muscular tissues and uses neither drains nor sutures. After making the flaps and tying the arteries, he places the flaps in apposition, and holds them there by means of a moist gauze bandage, three inches wide, applied so as to exert a uniform pressure, using neither drainage tubes nor sutures. The difficulty in the method is the application of direct pressure to the surface of the stump, which he does sufficiently to hinder serous exudation and to prevent bleeding. If there chance to be points in which the skin surfaces are not in exact apposition, they heal more quickly than the tracts left by the drainage-tubes.

The method of applying the pressure is not difficult to understand. The bandage begins on the under-side of the stump, passes over the end, and is repeated until the stump is covered over; during this time the apposition of the skin edges can be observed through the thin bandage. These longitudinal turns are followed by circular ones covering in the stump; then turns, starting on the sides and passing over the end of the stump, are used, followed again by spiral turns.

The bandage remains in place for from eight to ten days, when all the deeper portions will be found to have been healed. If pain or high fever show themselves, the author splits up the bandage, but does not remove it, covering it in with another bandage.

THE RADICAL CURE OF VARICOCELE BY THE BILATERAL RESECTION OF THE SCROTUM.

WICKHAM (*La Presse Méd.*, September 8, 1894) reviews a method which he has used for some time, describing a modification of the hæmostatic forceps devised by himself, by means of which the testicles and varicose veins are held close up to the external inguinal rings, while the sutures are passed and the scrotum resected. After its removal and complete hæmostasis the sutures are tightened and a compressive bandage applied. So much of the scrotum should be removed as is necessary to hold the testes in a position which would be maintained by a well-fitting and well-applied suspensory bandage; especial care should be taken to remove a sufficient amount from the perineal region. The author claims equal or greater efficiency for this method, with less danger than in the resection of the venous plexus.

OTOLOGY.

UNDER THE CHARGE OF

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A CASE OF PRIMARY MASTOIDITIS.

L. LOCOARRET, of Toulouse (*Annales des Maladies de l'Oreille*, Tome xx., No. 1), reports a case under the above title, which seems to be an example of intra-mastoid congestion, inflammation, and suppuration, *induced by excessive* counter-irritation over the mastoid, to relieve neuralgia in a man sixty-seven years old. The violent revulsive treatment at this point induced a cellulitis, phlebitis of the mastoid vein, and then intra-mastoid inflammation, as can be seen by "reading between the lines" of the report of this case, as in that of many other similar cases lately reported.

PATHOLOGICAL CONDITIONS FOLLOWING PIERCING OF THE LOBULES OF THE EAR.

DR. MAX THORNER, of Cincinnati, Ohio, reports, as a consequence of piercing the lobules of the ears, erysipelas of the auricle and face, eczema of the auricle, tumors of the auricle, fibroma and keloid of the auricle and face.—*Journal of the American Medical Association*, vol. xxii., No. 4.

CLOSURE OF THE EAR BY GROWTHS OF BONE.

DR. ROBERT BARCLAY, of St. Louis, Mo., gives an account of the closure of the ear by growths of bone, and removal of the same followed by cure of otorrhœa and deafness, with a description of the operations and instruments employed in three cases.—*Philadelphia Medical News*, vol. lxii., No. 16.

BILATERAL HÆMATOMA OF THE LOBULE.

RANDALL reports a case of bilateral hæmatoma of the auricle, resulting from traction on the auricle as a means of resuscitation from an epileptic fit. The sacs were opened, giving exit to no pus, but a little dark blood. The cavities extended to the slightly bared lower end of the auricular cartilage.

The cavities were gently curetted, and "vigorously rubbed" with iodine glycerite, packed with iodoform gauze, and covered with a pressure bandage. They rapidly healed.—*Archives of Otology*, vol. xxiii., No. 3.

BOILS IN THE EAR.

As a microbicide, naphtholate of soda, 4 or 5 to 1000, is recommended by DE ROSSI, of Rome.—*Annales des Maladies de l'Oreille*, tome xx., No. 5, p. 503.

ACOUSTIC SIGNALS AND RAILROAD EMPLOYÉS.

GRAZZI maintains that the ears should be examined as carefully as the eyes in those applying for employment on railroads. He also claims that the employés who are exposed to acoustic signals should be examined periodically, and many of these signals diminished in intensity as being injurious to hearing.

KIRCHNER, too, urged the importance of examining periodically the ears of railway employés.

MOOS stated that most of the rules named by Grazzi are in force in the Grand Duchy of Baden.

ZENES and POLITZER stated that in neither Hungary nor in Austria are the ears of railway employés examined.—Eleventh International Congress, *Annales des Maladies de l'Oreille*, tome xx., No. 5.

EXCISION OF THE MALLEUS.

A. EITELBERG, in writing of this operation, says its chief indication is caries of this bonelet. In sclerosis of the middle ear its application, though attended sometimes with relief of tinnitus and deafness, even in the unoperated ear through the synergetic action of the two tensores tympanorum, is usually followed by suppurative otitis media, the *outcome of which no one can foresee.*—*Annales des Maladies de l'Oreille*, tome xx., No. 5.

SYPHILIS OF THE EAR.

TOEPLITZ gives an account of a case in which the labyrinth was first attacked without previous otitis media. This occurred in the second stage of the malady, coincidentally with roseola and buccal mucous patches. Deafness first called attention to the malady and led to the diagnosis of syphilis. There were attacks of vertigo. Cure followed mercurial inunctions and injections of pilocarpine.—*Annales des Maladies de l'Oreille*, tome xx., No. 5.

THE TREATMENT OF TINNITUS IN AURAL SCLEROSIS.

DR. R. W. SEISS, of Philadelphia, recommends as the most advantageous methods of controlling "that never altogether curable disease," "proper treatment of the naso-pharynx first, methods directed to the Eustachian tubes next, and immediate local treatment of the tympanum last, in order of efficiency."

The writer has found the best form of tubal medication in tinnitus of catarrhal origin consists in injections of pure fluid albolene containing one-half grain of camphor and two grains of menthol to the fluidounce of the oil into the tube by means of the Eustachian catheter. Menthol vaporization is also recommended for allaying tinnitus dependent upon tubal congestion and inflammation.—*Annals of Ophthalmology and Otology*, vol. iii., No. 1.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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Antral Odontoma Obstructing the Nasal Passage.

Dr. A. W. de Roaldes, of New Orleans, reports (*N. Y. Med. Journ.*, 1894, No. 833) a case of compound follicular odontoma invading the maxillary sinus and obstructing the corresponding nasal fossa. The patient was a lad, nine years of age, and the lesion occupied the right maxilla.

De Roaldes calls attention to the circumstance that these growths are usually upon the right side of the body. The tumor was extracted by direct access after removal of the whole anterior surface of the maxilla from the nostril to the tuberosity, and from the infraorbital plate to the alveolar border. The main mass of the tumor was on the floor of the antrum corresponding to the canine fossa. Its surface was covered with fifty or more tufts of hard, adherent tissue, resembling the lining of an alveolus. The recovery was as satisfactory as possible; nevertheless, De Roaldes expresses the opinion that a more conservative procedure through the mouth and canine fossa might have yielded equally good results.

The article is illustrated and accompanied with a copious list of bibliographic references.

Tonsil Disease and Rheumatism.

In studying the etiology of rheumatic affections due to disease of the tonsils, Dr. H. L. Wagner, of San Francisco, has found (*N. Y. Med. Journ.*, 1894, No. 830) that the joints generally affected are those most in use by the patients: the crico-arytenoid joints in singers, the knee-joints of shoe-dealers, the wrist-joints of violinists, bookkeepers, and so on. Hence he contends that the rheumatism is not due to ptomaines, but to migration of the germs present in folliculous amygdalitis. He has found the same micro-organisms in the synovial fluid of the knee-joint in two instances, and in the urine of nearly all his cases, as existed in their diseased tonsils, while the family and clinical histories of the patients were free from taint of rheumatism before the attack of tonsillar disease.

EXUDATIVE PHARYNGITIS.

PROF. WM. C. GLASGOW, of St. Louis, reports (*N. Y. Med. Journ.*, 1894, No. 830) a case of exudative pharyngitis in a child aged ten months, and which he regarded as one of the protean manifestations of influenza. After an unusual exposure to cold, the attack began with a febrile otalgia of two days' duration, followed by febrile coryza, with copious discharge of acrid mucus, excoriative to all cutaneous tissues with which it came in contact. Then an exudation became developed on the tonsils, uvula, soft palate, and pharynx; but none was visible in the anterior nares. There was aphonia and urgent dyspnœa, so that the larynx was in all probability involved also. Under constitutional treatment with sodium benzoate, salol and brandy, and the topical use of hydrogen dioxide with boroglyceride, convalescence was remarkedly rapid and complete, being only slightly interrupted by a suppurative otitis.

FOREIGN BODIES IN THE LARYNX.

DR. A. W. DE ROALDES, of New Orleans, reports (*N. Y. Med. Journ.*, 1894, No. 830) a case in which a $2.50 gold piece became impacted in the larynx just beneath the ventricular bands, where it was firmly held in horizontal position, with the sides of the coin imbedded in the two ventricles. It was removed with forceps. The laryngoscopic illustrations accompanying this report are among the very best that have been published.

ANGIOKERATOMA OF THE VOCAL BAND.

DR. E. J. MOURE, of Bordeaux (*Sur un Cas d'Angiokératome de la Corde Vocale droite*, 1894) describes this unique case, which presented in the person of a woman, twenty-six years of age, who had been continuously hoarse for two years following an attack of influenza. She was also the bearer of a fasciculated sarcoma of the dorsal aspect of one of the fingers of the right hand.

The growth was sessile, about the bulk of a millet-seed, and occupied the central portion of the vocal band. After removal with cutting forceps, a microscopical examination was made by Dr. J. Sabrazés, whose detailed report, illustrated with woodcuts, accompanies the report.

CHRONIC LARYNGITIS.

IN an article on chronic laryngitis (*Berliner klin. Wochenschrift*, 1894, No. 16), DR. H. KRAUSE recommends scarification of the congested mucous membrane; a practice much more common in the United States twenty or more years ago than it is at present—and an excellent practice as attested by the paper before us.

LARYNGEAL LESIONS IN ENTERIC FEVER.

DR. L. LUCATELLO, in a contribution to the pathogenesis of the laryngeal lesions in "Typhus," finds that they are noted as catarrh, erosions, infiltrations, ulcerations, diphtheritis, perichondritis, and paralysis. The experimental researches described show that the morbid processes are exclusively attributable to the specific microbe of typhus. The consequent destruction of the mucous membrane assembles other micro-organisms, the pyogenic varieties among others, and so abscesses are formed between the perichondrium and the cartilage, which are doubtless ascribable to secondary infection.

OPHTHALMOLOGY.

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Plastic Restoration of the Lower Eyelid.

TYREE (*Kansas City Medical Index*, No. 179, p. 347) has reported two cases of extensive destruction of the lower eyelid in which successful restoration was effected by means of plastic operation. The first occurred in a man who had lost the entire lower lid and the right side of the nose to the septum and the medium line, and considerable of the integument and periosteum covering the superior maxilla of the same side, in consequence of the application, by an irregular practitioner, of some sort of paste to remove what the patient was made to believe was a malignant growth. A flap of skin was removed from the forehead and accurately sutured upon the right side of the nose. Of the lower lid nothing was left but the narrow ciliary border containing the lashes, and this was drawn by cicatrices down upon the cheek. The strip containing the cilia was dissected up and attached to the upper lid, leaving a space to be filled by a flap, which was taken from the cheek external to the canthus and twisted over. The result was entirely satisfactory, and remained so after the lapse of eight months. The second case occurred in a farmer with an epithelioma of the lower lid, involving also the lining conjunctiva, the ciliary margin, and to some extent the integument. The new growth, together with the entire lid and conjunctiva down to the eyeball were removed, and replaced by a flap from the adjacent tissues. There had been no return of the neoplasm eighteen months after the operation.

A Case of Complete Ankyloblepharon.

At a recent meeting of the London Ophthalmological Society, CAMPBELL (*Lancet*, No. 3716, p. 1159) reported the case of a native of upper Egypt, fifty years old, who presented a large rounded tumor which completely concealed the right orbit. The swelling was dull-red and shiny, with some large veins on its surface, and measured laterally 4.8 cm., and vertically 3.2 cm., projecting forward 3.2 cm. from the orbital margin. It was tense, but fluctuating, and moved co-ordinately with the other eye. It was stated that sight had been lost from childhood, and that the swelling had appeared on previous occasions, but had subsided upon the application of poultices. On minute examination a trace of palpebral slit without eyelashes was detected at the lower margin of the tumor, and the opinion was formed that the case was one of complete ankyloblepharon, with retained, and probably semi-purulent, lacrymal secretion. This was confirmed on the day preceding that fixed for operation by the giving way of the skin in the centre of the upper eyelid, attended with escape of semi-purulent fluid and total collapse of the tumor. To obviate recurrence, the palpebral slit was reopened and the conjunctival sac dilated, but no attempt was made to reëstablish the lacrymal channels, owing to the profound changes in the parts from cicatrization.

SUTURE OF THE CORNEA IN EXTRACTION OF CATARACT.

KALT (*Archives of Ophthalmology*, vol. xxiii., No. 4, p. 421) has systematically employed suture of the cornea in fifty cases of simple extraction of the cataractous crystalline lens, with perfect results in forty-five. In two cases reposition of the iris was difficult, and could not be maintained until the suture was tied anew. The result, however, was excellent. In one case of retrogressive cataract prolapse of the iris ensued: In two cases normal operation was followed by angular incarceration of the iris, but with the presence of the suture the excision of the iris was easy. In suturing the cornea a fine, sharp-pointed, sterilized needle, threaded with thin, strong sterilized silk is, after cocainization and disinfection of the eye, passed through the cornea in the vertical meridian about 1 mm. below the limbus, the point of the needle being made, without penetrating the anterior chamber, to emerge opposite the opaque border, when the thread is drawn. The needle is then introduced into the episcleral tissue about 1 mm. above its point of exit, as in muscular advancement. As soon as the point has penetrated resistant tissue it is withdrawn, in order to involve as little of this tissue as possible. As it is impossible to withdraw the needle at right angles, about 2 mm. of conjunctiva are loaded on it. In withdrawing this thread a loop is left which is placed upon the nasal side, and carefully spread out so as to avoid twisting. The cornea is divided in the usual way, care being taken that the knife passes nicely through that portion of the cornea which has been left free by the suture. The speculum is then removed and the cataract extracted as usual. When the iris is well in position an assistant holds the upper lid and the suture is tied. Whatever of infolding of the cornea takes place disappears in the course of a day or two, and the corneal astigmatism is neither increased nor diminished. The suture causes no inconvenience, and will rarely need to be removed before the tenth day, when it will have become quite loose. Involuntary division of the suture with the Graefe knife is to be avoided. When the suture has been tied the superior scleral end should be drawn upon, and the coaptation takes place of itself. The slight opalescence left in the track of the suture soon disappears.

DERMATOLOGY.

UNDER THE CHARGE OF

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Pavement-celled Epithelioma.

In a histological study of epithelioma (*Annales de Derm. et de Syph.*, 1894, No. 2) Keser arrives at the following conclusion: The figures observed in epithelioma, and described as being coccidia, undoubtedly exist, but they are nothing else than the result of a typical degeneration of the epithelial cells. The author's reasons for this conclusion are:

1. Neither spores nor sporiferous cysts are found in epithelioma, nor any other species of figures comparable to any parasite.
2. All the stages of regressive evolution of the cell have been observed from its beginning, when the nucleus of the included figure is still completely identical with that of the enveloping cell, or of the neighboring cells, up to the period when the analogy with a coccidium becomes most striking.
3. The manner in which the degenerated protoplasm behaves in the presence of certain coloring matters, either in the beginning or at the end of its metamorphoses.
4. Identically the same figures are found in a physiological tissue where all intervention of a parasitic nature can be excluded, viz., in the balanopræputial groove of the fœtus.

Lupus Erythematosus as an Imitator of Various Forms of Dermatitis.

Radcliff Crocker (*Journ. Cut. and Gen.-Urin. Dis.*, January, 1894) takes the view that lupus erythematosus comes but little, if at all, behind eczema, scabies, and syphilitic eruptions in polymorphism, and gives cases in which it simulated erythema tuberculatum, erythema diffusum, psoriasis guttata, lichen planus in patches, lupus vulgaris in multiple single nodules, or small groups of nodules, and patches of telangiectasis.

Invasion of the Body by Cocci from the Skin in Eczema.

Bernheim (*Centralbl. für Bakteriologie*, Feb. 5, 1894) gives the notes of a case of very extensive eczema in an infant aged four months which terminated fatally. The autopsy revealed acute enteritis, swelling of the spleen, parenchymatous changes in the liver, and œdema of the lungs. The author supposes that the cocci present in the various parts had entered by the skin, and that the fatal result was due to septic intoxication by the products of the microbes, which had entered from the surface. At the point of entry the epithelium was lacking, and the cocci could be traced through the corium to the subcutaneous tissue and lymphatic spaces, in which they were found abundantly. A sudden fatal termination in suckling infants affected with eczema has also been observed by O. Wyss.

MADURA DISEASE (MYCETOMA) AND ACTINOMYCOSIS.

A. A. KANTHACK (*Journal of Pathology and Bacteriology*, 1893) has demonstrated the correctness of the views expressed by Vandyke Carter, who first recognized Madura foot as a distinct disease, and stated that it was probably due to the same fungus as actinomycosis. KANTHACK examined fifteen specimens of the disease—twelve of the "ochroid" and three of the "melanoid" variety. He concludes that the fish-roe-like granules of the yellow variety were undoubtedly a form of rare fungus, and the black masses in their most perfect form a like parasite in a state of degeneration. The name "dospora indica" is suggested for the parasite, with, for the present, two varieties—"flava" and "nigra."

THE BIOLOGY OF THE RINGWORM ORGANISM.

MACFAYDEN (*British Medical Journal*, September 22, 1894), endeavoring to determine whether the trichophyton produces ferments, summarizes the results of his research as follows:

1. "The ringworm organism produces a proteolytic enzyme which liquefies gelatine very rapidly.

2. "This enzyme is capable of acting even when diluted, and is very stable, as its action can be demonstrated in cultures three months old.

3. "This enzyme acts most rapidly at or near blood-heat. At blood-heat a complete liquefaction of 10 per cent. gelatine was produced in fifteen to seventeen hours.

4. "Exposure to a temperature of 100° C. for two minutes destroys the ferment.

5. "The proteolytic enzyme is also produced in simple beef broth; acidity hinders and alkalinity favors its production.

6. "The gelatine containing the active enzyme did not exert any inimical action upon the staphylococcus pyogenes aureus or the bacillus pyocyaneus.

7. "The formation of a diastasic ferment by the ringworm organism was not demonstrated, but it grew well in solutions of grape-sugar and milk-sugar.

8. "A slight growth was obtained on cane-sugar soils and evidence obtained of the presence of a feeble inverting ferment.

9. "A milk-curdling ferment is not produced by the trichophyton.

10. "The best soil for its growth was Dr. Sabouraud's beerwort agar, consisting of beerwort with the addition of 1.5 per cent. of agar.

11. "It may be that the proteolytic enzyme aids the organism in softening the tissues and overcoming their resistance to the penetration of the hyphæ. It would be interesting in this connection to test the action of the enzyme on keratin, and experiments are being at the present time carried out in this direction."

OBSTETRICS.

UNDER THE CHARGE OF

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REPEATED CÆSAREAN SECTION.

In the *New York Polyclinic*, 1894, vol. iv., No. 2, COE reports the case of a dwarf of deficient mental development with a justo-minor pelvis highly contracted, on whom he performed Cæsarean section in January, 1891, a living child being delivered. During her convalescence the patient was unruly, and burst open the wound, the intestines protruding. The wound was again closed, and recovery followed. In autumn, 1893, she was again operated on, and the adhesions were separated. In April, 1894, she was again pregnant at six months. She was kept under care in hospital and delivered by Cæsarean section at the expiration of nine months' gestation. The abdominal and uterine incisions were made at the side of the former incision, and the adhesions were avoided. The omentum was resected where adherent. The tubes were ligated to prevent further impregnation. Although the wound became nfected from bad catgut, the patient recovered. Her child survived.

GUÉNIOT, in the *Annales de Gynécologie*, 1894, vol. xlii., p. 98, reports two cases of repeated Cæsarean section performed on rhachitic women—one of them a dwarf. In one case the points where uterine sutures had been inserted seventeen months before were plainly visible. No difficulty from adhesion or lack of primary union was experienced in these repeated operations. In contrast with repeated and difficult deliveries with forceps or craniotomy, these cases show the better results for mother and child following surgical delivery.

THE PERMANENT RESULTS OF SYMPHYSIOTOMY.

Sufficient time has now elapsed since the wide adoption of symphysiotomy by antiseptic methods to furnish data which will assist in estimating the permanent results of the operation. As most of the patients requiring the operation are dependent on their work for a livelihood, it becomes a serious matter to ascertain the condition of health as regards ability to work which can be promised to these patients in selecting this operation. The reports from Schauta's and Gustav Braun's clinics by VON WOERZ and RICHARD BRAUN

(*Centralbl. für Gynäkologie*, 1894, Nos. 36 and 37) afford data of value upon this question.

Von Woerz reports ten symphysiotomies performed some time previously, most of the patients being still available for observation. Of the 10 patients, 1 died of sepsis after the operation; 6 are in good condition, abundantly able to work without inconvenience; 1 could not be followed after leaving hospital care; 1 cannot stoop to work on her hands and knees without pain in the sacro-iliac joints; 1 suffered from incontinence of urine, which was cured by taking cold baths.

Braun reports 8 symphysiotomies, and of these none died; 6 are now in good condition, working without inconvenience; 1 suffers from incontinence of urine and sacro-iliac pain on heavy lifting; 1 has incontinence of urine on straining and lifting.

In Von Woerz's cases 5 were treated by drilling the symphysis and wiring with silver wire; in 4 the wire suture could not be successfully applied, and 1 had no suture. While good union is possible without suture, yet suture is preferable.

Braun treated his cases, with drilling and wiring, 3; with suture of the periosteum, 4; and without suture, 1. There seemed to be no difference in the result in these cases.

From these cases the conclusion may be fairly drawn that symphysiotomy under good surgical care is an operation undoubtedly saving fœtal life at no serious risk of death or permanent disability to the mother. In view of the excellent results obtained without drilling and wiring the symphysis, the procedure is unnecessary.

Puerperal Sepsis from the Bacterium Coli Commune.

In the *Archiv für Gynäkologie*, 1894, Band 74, Heft 2, Eisenhart describes an interesting case of puerperal purulent peritonitis, with abscess below Poupart's ligament, and fatal uræmia, from acute parenchymatous nephritis. The *bacterium coli commune* was found in the pus from the abscess and in the urine. Post-mortem showed that the infection started outside of the peritoneum, the bacteria gaining access to the site of the placental attachment and to the bladder from the rectum.

Eisenhart very properly condemns the methods of obstetric examination or treatment in which the finger of the obstetrician enters the rectum.

Treatment of Placenta Prævia by Means of the Intra-uterine Colpeurynter.

Dührssen (*Deutsche medicinische Wochenschrift*, 1894, No. 19) contributes an article on the above subject. The introduction by Braxton Hicks of the method of treating this condition by means of combined version has given excellent results for the mother, but quite different for the child; the mortality of the latter reaching 60 per cent. The great disadvantages of this method are avoided by the introduction of the uterine colpeurynter, and this can be easily made aseptic. In six cases which the author reports, all the mothers did well, and five of the children were born living. Two points are to be carefully observed in this method: 1. To introduce the colpeurynter into the ovisac, the membranes being ruptured. 2. To make steady, regular traction on the distended instrument, so as to compress the detached placental flap against the bleeding uterine vessels. This is best done by making traction through the tube. In 50 per cent. of cases, within three hours the instrument is expelled by uterine contraction, and birth ensues.

Not over half a liter of water should be put in the bulb. Cremaillier's long ball forceps are the best for introducing the folded colpeurynter into the uterus, and the introduction is practicable whenever the fingers can be introduced into the cervical canal. The finger should remain in after the bag is introduced until it is filled properly. If it be necessary to remove it, the fingers must be disinfected and carried up to the bulb, but no effort should be made to withdraw it by dragging on the tube.

THE PATHOGENESIS OF PUERPERAL INFECTION.

CZEMETSCHKA (*Prager medicinische Wochenschrift*, 1894, No. 19) presents a record of notes made from a post-mortem held on a woman who five days before death had been delivered of a viable child. During the course of labor the patient developed a right-sided pneumonia, and the following day labor was terminated by the forceps. Four days after meningitis set in and death ensued. The post-mortem showed a fibrous pneumonia of the right lung, suppurative rhinitis, meningitis. Suppurative processes were established in many other organs.

The starting-point of the infection, whether in the genital tract or in the lungs, could only be proven by bacteriological examination.

The child died thirty-six hours after birth, and an examination showed that it also had pneumonia. Cover-glass preparations from the lungs showed only the diplococcus lanceolatus with distinct capsule formation. In agar plate needle cultures the diplococcus pneumoniæ (Frankel-Weichselbaum) only could be found.

During the post-mortem section of the mother, specimens were taken of pus from the nose, meninges, from the incrustations of the mitral valves, from the right lung, and metro-lymphangitic suppuration by means of capillary tubes. From these, cover-glass preparations stained with Löffler's methyl-blue gave diplococci. Specimens of nasal pus gave similar results, together with many slender short bacilli negative to Gram's method. Material from the left uterine cornu, and from the mitral valve itself, also gave evidences of the presence of the diplococcus. The author concludes that the woman while pregnant was probably infected from the nose with the diplococcus pneumoniæ. From this ensued pneumonia, meningitis, and endocarditis. The fœtus in utero also acquired the disease from the mother. During the birth the uterine blood infected the vagina with the diplococcus through small fissures in its walls, and hence came the metro-lymphangitis.

The "puerperal process" here was not begotten from without, but the disease of the genital apparatus was a partial manifestation of a general infection of diplococci.

GYNECOLOGY.

UNDER THE CHARGE OF

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STRICTURE OF THE FEMALE URETHRA.

KLEINWÄCHTER (*Zeitschrift für Geb. u. Gynäk.*, Bd. xviii.) finds stricture more rarely than other observers, having noted it in only three instances in three thousand gynecological cases. He is skeptical with regard to the congenital form, believing that gonorrhœal urethritis is the most common cause; syphilis and lupus are rare etiological factors. He noted one case of urethral stenosis in an old woman, due to general thickening of the submucous connective tissue, the cause of which was unknown. Traumatism during labor may result in cicatricial contraction of the canal.

The diagnosis is made by the presence of difficult urination and opposition to the passage of a bougie. Gradual dilatation under cocaine-anæsthesia is preferable to a cutting operation, which should only be resorted to in obstinate cases. Treatment with galvanism is still better.

INTESTINAL OBSTRUCTION AFTER CŒLIOTOMY.

SCHIFFER (*Centralblatt für Gynäkologie*, 1894, No. 38), in a paper read before the Leipzig Obstetrical Society, comparing the results of dry and moist asepsis in abdominal section, arrives at the conclusion that when the latter method is adopted there is less disturbance of the normal intestinal peristalsis than with the former. Thus, during the two years in which sterilization by dry heat was employed in Sänger's clinic there were five fatal cases of intestinal obstruction following one hundred and thirty-two cœliotomies, *i.e.*, fifty per cent. of the deaths were due to this cause. From November, 1893 to July, 1894, when moist sterilization was used, there were only two deaths from cardiac failure in seventy-six abdominal sections, there being no instance in which flatus failed to pass per anum within forty-eight hours after the operation.

The writer believes that when the peritoneum is kept moist its epithelium is less apt to be destroyed, adhesions are rare, and the normal absorptive power of the membrane is preserved, whereby culture-media for germs are removed.

In the discussion of this paper ZWEIFEL disagreed with the reader, though in 307 cases of cœliotomy in which the dry method was used there were two deaths from ileus, while there were no cases in four hundred others in which moist sterilization was practised. He believed that it was much more important whether the compresses which came in contact with the intestines were warm than whether they were moist or dry.

SÄNGER thought that dry compresses were perhaps better if eventration was practised, though he himself never found this necessary when the patient was in Trendelenburg's posture. When the intestines were exposed with a long incision, he was accustomed to cover them with warm, moist compresses.

THE RADICAL REMOVAL OF THE CANCEROUS UTERUS.

MACKENRODT (*Zeitschrift für Geb. u. Gynäkologie*, Bd. xxix.) calls attention to the fact that while vaginal extirpation of the cancerous uterus may now be regarded as a perfectly safe operation, so far as the immediate recovery of the patients is concerned, less than one-half are cured. This is unquestionably due to the fact that the operation is not sufficiently radical, that is, cancerous foci are left in the broad ligaments. Infection of healthy raw surfaces with cancer-cells during the operation, as suggested by Winter, may account for a certain number of the early recurrences.

Examinations of numerous cancerous uteri, extirpated per vaginam, have convinced the writer that with the aid of the microscope it is often found that foci of disease are actually present on the raw surface of the organ when the operator thought that he had cut entirely beyond its limits. In order to secure freedom from recurrence it is necessary to remove more of the parametric tissues than has hitherto been done through fear of injuring the ureters. In order to avoid the latter accident the bladder should be separated not only from the uterus, but from the anterior layers of the broad ligaments. If this dissection is thoroughly made before ligating and dividing the ligaments, not only will the ureters be pushed aside out of the way, but the tissues can be excised at least an inch outside of the cervix. Above the level of the os internum there is practically no danger of injuring the ureters. This complete separation of the bladder can be accomplished as well per vaginam as through the abdominal route, the latter being, of course, preferable when the vagina is narrow, the uterus unusually large, or when the disease has extended to some distance beyond the organ.

ACUTE ASEPTIC PERITONITIS.

HARTMANN and **MORAX** (*Annales de Gyn. et d'Obstétrique*, 1894, No. 3) report two cases of general peritonitis in the service of Terrier, in which they believe that they were able to positively exclude any infectious origin. The first case was that of a young girl, aged eighteen, who was suddenly attacked with abdominal pains and vomiting two hours after eating her breakfast. Forty-eight hours later she entered the hospital with a pulse of 120, constant vomiting, general abdominal pain and tympanites, but with a *normal* temperature. No gas had escaped per rectum since the attack. Cœliotomy was at once performed, and the omentum was found to be thickened, congested, and adherent to the anterior abdominal wall. On separating it eight or ten ounces of sanguinolent fluid, containing flakes of fibrin, escaped. The intestines were adherent and were covered with organized lymph. A twist in the gut was found, and freed, the adhesions being separated. The wound was then closed without irrigation or drainage. All the symptoms speedily disappeared, and the patient made a rapid recovery. A rigid bacteriological examination of the peritoneal fluid and pseudomembranes showed an entire absence of micro-organisms. Culture experiments were negative.

In the second case a woman, aged forty-nine, with ovarian cyst, was operated upon by Terrier for torsion of the pedicle with general peritonitis. The condition was practically the same as in the first instance, and the results of the bacteriological examination were negative as before. The writers add that while non-septic peritonitis has been described by Schrœder in connection with secondary changes in ovarian cysts (inflammation, torsion, and rupture), it has never been carefully studied. He affirmed that peritonitis with this origin was almost invariably cured by cœliotomy. This, would seem to show that the successful result of ovariotomies performed during attacks of acute general peritonitis is due more to the mild nature of the disease than to the adoption of any special technique, including irrigation of the abdominal cavity, which was not employed in either of the cases cited.

There is nothing in the appearance of the tissues and organs seen at the operating-table by which one can distinguish the septic from the non-infectious form of inflammation. The aseptic nature of the process may be inferred from the history of the case, and is confirmed by the results of the bacteriological examination.

The prognosis in the non-infectious variety is good, but in the septic surgical interference is rarely successful by reason of the wide dissemination of infectious germs. Even though fresh inroads of micro-organisms may be prevented by cœliotomy, irrigation, and drainage, it is practically impossible to remove entirely those which have already been distributed throughout the peritoneal cavity. [This short paper furnishes a powerful argument against the widespread practice of irrigation of the peritoneal cavity, not only in cases of general peritonitis, but after the evacuation of circumscribed purulent collections within the pelvis. The results obtained by those surgeons who simply sponge out the pelvic cavity (the patient being in Trendelenburg's posture, with the intestines carefully protected by compresses) and seldom drain compare so favorably with those of cœliotomists who irrigate and drain in a large proportion of their cases of pelvic suppuration, that the dogmatic statements of the latter in favor of their own method can no longer be accepted without question.—H. C. C.]

TRANSPERITONEAL HYSTERORRHAPHY.

VON HERFF (*Münchener med. Wochenschrift*, 1894, No. 41) reviews the history of this operation, noting especially Krug's method, and decides in favor of ventro-fixation after opening the abdomen. According to the writer's experience cases are rare in which serious symptoms are caused by simple, uncomplicated retroflexion; such symptoms are nearly always due to accompanying disease of the adnexa, the extent of which can only be determined by cœliotomy. In sixteen cases of ventro-fixation, performed by the late Dr. Kaltenbach during the course of six and one-half years, but three were cases of uncomplicated retroflexion, and only one was regarded as suitable for the transperitoneal method. The patients were all permanently cured. The writer emphasizes the fact that many patients with retro-displacement have coincident nervous symptoms which are not really due to the local condition, so that they are subjects for the neurologist rather than for the surgeon.

PÆDIATRICS.

UNDER THE CHARGE OF
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The Respiratory Complications of Varicella.

Boucheron (*Thèse de Paris*, 1893) devotes an inaugural thesis to a study of the little known respiratory complications of varicella. These, with nephritis, gangrene, multiple hemorrhages, and infectious rheumatism, go to modify the usually favorable prognosis of this disease. One of the cases will bear quotation.

A little girl was admitted to the hospital with a serious case of whooping-cough, which after a time became complicated with a broncho-pneumonia. Fifteen days later, on February 20th, the first crop of vesicles of a varicella made their appearance, and this was followed by several others. Gradually the child assumed a waxy pallor, and swelling of the face was noted, though albuminuria was not present. During the night of the 2d and 3d of March the child manifested difficulty in breathing through the nose, the nostrils being filled with crusts and discharging a sanguinolent fluid. On the 9th, symptoms of suffocation of such violence appeared that tracheotomy was discussed, but they yielded for the time to the application of a hot sponge over the larynx. Death occurred from suffocation on the following day. The autopsy showed a double broncho-pneumonia. There was no œdema of the larynx, but its mucous membrane was congested, presenting points of ecchymosis, especially about the true vocal cords and upon the under surface of the epiglottis. Posteriorly, between the two arytenoids, near the vocal cords, and upon the cords themselves, were found small vesico-pustules analogous to those found on the skin. The erosion produced by these, however, was very superficial. Whether these vesicles are to be regarded as a true localization of a varicellous eruption upon the laryngeal mucous membrane, the author is considerably in doubt. This accident had occurred about the 10th of March, while the first crop of vesicles appeared February 20th, at a time when the lung presented lesions of broncho-pneumonia and the kidneys those of nephritis.

Bronchitis is quite frequent; it may precede, accompany, or follow the eruption (cases of Rondot, Valin, Galliard). The author considers this bronchial inflammation as a specific manifestation of the disease, and not a simple coincidence.

Broncho-pneumonias are divided by him into two groups. In the first are the cases where broncho-pneumonia is late, and where varicella clearly seems to furnish the pulmonary lesion (cases of Rogivue, Hogyes, Semtchenko). The second group contains the pneumonias which occur in the first few days, as in the case of Manouvriez, where a broncho-pneumonia appeared in the beginning, and was heralded two or three days in advance by convulsions.

Pleuro-pneumonia as a complication of varicella is illustrated by an observation of Rille, who found it in an infant of nine months, and by another of Abercrombie, who at the autopsy upon a case of gangrenous varicella found a double pneumonia with a pleural exudate upon one side.

Finally, he reports an observation of Semtchenko relative to the autopsy upon a female infant of eleven months, who succumbed to a purulent pleurisy beginning three days after the complete disappearance of a varicellous eruption.

FURTHER STUDIES ON INDICANURIA.

To complete our review of the literature bearing upon the value of the so-called Hochsinger's sign in tuberculosis of children (see AMERICAN JOURNAL OF THE MEDICAL SCIENCES, October, 1894, p. 492), reference must be made to two recent publications.

GEHLIG (*Jahrbuch f. Kinderheilkunde*, 1894, xxxviii, p. 285) gives the following conclusions based upon a considerable number of observations upon children both sick and well:

1. Nurslings in good health or children fed upon sterilized milk, and not the subjects of digestive troubles, sometimes present a trace of indican in the urine.
2. If digestive disturbances occur almost always some indican is found, its quantity varying with the gravity of the affection. In chronic catarrh of the intestine, cholera, and typhoid fever, it is particularly marked.
3. In older children without digestive trouble the urine normally contains indican. If the diet includes a high proportion of nitrogenous food (eggs, meat), indican becomes more abundant.
4. There exists no relation between tuberculosis and a more or less marked indicanuria.

CIMA (*Transactions International Congress of Rome*, 1894) gives the results of examinations in sixty-eight cases. Most of these children were fed simply on bread and milk, some on bouillon, vegetables, and eggs, and others on mother's or cow's milk.

1. Cases of clinically declared tuberculosis of abdominal or thoracic organs—ten cases. Almost all had some irregularity of digestion, and the stools were mostly liquid or semi-fluid. In ninety-nine analyses sixty-nine, or 69.69 per cent., gave positive reactions, while medium or very marked reactions were given in nearly half, or 45.5 per cent. In these same cases very marked reactions were obtained after some days of feeding upon a diet richer in albuminoids, or during constipation. On the other hand, the reaction was slight or feeble when the children were put upon milk or had liquid or semi-fluid stools.
2. Cases suspected of tuberculosis, with adenopathy, chronic catarrh of intestines, or intermittent catarrh of bronchi—twenty-three cases. In seventy-three analyses, 75.34 per cent. positive reactions, or 46.57 per cent. of medium or marked reactions.
3. Cases of divers acute and chronic diseases—thirty-five cases. In eighty-eight examinations thirty-eight were without reaction, while 30 per

cent. of medium or marked reaction were given for the most part by children over two years of age nourished on a mixed diet.

The conclusion from these results is that the indican reaction in the urine is more positively connected with anomalies of digestion, especially in mixed feeding, than with the principal malady. Consequently indican has no other diagnostic importance than that of indicating the degree of decomposition of albuminoid substances in the intestines.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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IMMUNITY: NATURAL AND ARTIFICIAL.

THE recent development of our ideas regarding immunity is traced in an interesting paper by BUCHNER, read before the Eighth International Congress of Hygiene and Demography at Buda-Pesth (*Münch. med. Woch.*, 1894, Nos. 37 and 38), in which the essential differences between the natural immunity of certain animals to bacterial influences and the immunity artificially conferred by experiment are emphasized. The elaborate argument embodying the results of the investigations of the past three years is summed up in the following conclusions:

1. The natural power of resisting infection, the so-called natural immunity, depends upon distinctly different conditions and causes from the artificially induced immunity. They are, therefore, essentially different conditions, which, from the scientific standpoint, should be kept quite distinct from one another, and investigated each for itself, although practically they may be coexistent in the same individual.

2. Natural immunity depends, on the one hand, on the bactericidal action of certain substances in solution in the organism, the so-called *alexines*, or, on the other hand, on an inherited insusceptibility of the tissues and cells of the body to the several bacterial poisons. This natural immunity cannot, as a rule, be transmitted to the body of another animal by means of the blood.

3. The leucocytes play an important rôle in the protection of the body by natural immunity, not as phagocytes, but through the action of soluble substances secreted by them. Phagocytosis is only a secondary function.

4. Artificial or acquired immunity depends on the presence of modified specific bacterial products, the so-called *antitoxines*, either in the blood, in the tissues, or in both. By transfer of the blood these specific antitoxines can be transmitted to another organism, thereby conferring upon it artificial immunity.

5. The action of the antitoxines does not depend upon destruction of the specific bacterial poisons by contact with them, but occurs only in the animal

body and by its participation. By the presence of the antitoxines a lower degree of susceptibility of the living cells of the body to the specific toxines of the bacteria is in some way induced, thereby rendering the body as a whole resistant to the action of those poisons.

Two New Fixatives.

The following fixing solution is highly recommended by Zenker (*Münch. med. Woch.*, 1894, No. 27, 532), who claims for it all the advantages of the vastly more expensive Flemming and Hermann fluids:

Distilled water	100
Corrosive sublimate	5
Potassium bichromate	2.5
Sodium sulphate	1
Glacial acetic acid	5

It is best to add the acetic acid shortly before using; the remaining ingredients may be mixed and kept on hand indefinitely.

This fixative combines the advantages of sublimate and Muller's fluid fixation, the finer details of both nuclei and cell-bodies being admirably preserved. There is no shrinkage of the tissues, which stain well by all the usually employed methods, including those for the bacteria, and imbed well in celloidin or paraffin.

Small cubes of tissue about one cubic centimetre in volume are immersed in the fixative for twenty-four hours, are washed thoroughly in water, and are afterward hardened in alcohol of increasing strength, any traces of sublimate which may remain in the tissues being at the same time removed by the addition of a little tincture of iodine to the alcohol.

The cost of a litre of this fluid is less than fifteen cents.

The other recently-suggested fixative is a substance lately introduced into commerce under the name *formalin* or formol. Its exact chemical composition is disputed, but it is commonly stated to be a 40 per cent. aqueous solution of formic aldehyde. In 1893 this was suggested as a valuable fixative for animal tissues by Blum, and has since found many advocates.

A very thorough investigation of its qualities has recently been made by Reimer (*Fortschr. d. Med.*, 1894, xii., Nos. 20 and 21), at the suggestion of Professor Eberth, as the result of which it is recommended by him as an almost ideal fixative. It was used in 4 and 10 per cent. solutions, between which the results showed little choice. Its penetration was greater than that of any of the other fixatives with which it was compared (alcohol, sublimate, and Hermann's fluid), no perceptible shrinkage occurred, both nuclei and cell-bodies were well preserved, and the tissues stained brilliantly by the ordinary methods and by those for the bacteria. While immersion for twenty-four hours in the formalin solutions was sufficient to thoroughly fix even comparatively large portions of tissue, no injury resulted from a much longer soaking. The specimens may then be washed in water or dropped immediately into alcohol, the exact strength of which is immaterial, specimens placed immediately in absolute alcohol yielding as good results as those placed first in weaker. In 4 per cent. solution, formalin costs about twelve cents a quart.

HYGIENE AND PUBLIC HEALTH.

UNDER THE CHARGE OF
EDWARD F. WILLOUGHBY, M.D.,
OF LONDON;
AND
CHARLES HARRINGTON, M.D.,
INSTRUCTOR IN MATERIA MEDICA AND HYGIENE, HARVARD MEDICAL SCHOOL.

Purification of Water.

Moritz Traube (*Zeitschrift für Hygiene und Infectionskrankheiten*, Bd. xvi., p. 149) gives a simple method of purifying large volumes of water by means of chlorinated lime, which, added in even so small an amount as 0.000426 gramme to a hundred cubic centimetres of water, kills all the micro-organisms within two hours. The bacteria appear to be acted upon much more promptly than the other organic matter present. For the removal of the excess of the agent the addition of sulphite of sodium (0.000209 gm.) suffices, and an excess of this substance up to 50 per cent. more than the necessary amount does no harm, since the excess is oxidized within twelve to fourteen hours. Water thus treated has no disagreeable taste, and its hardness is not appreciably increased. To sterilize 1,000,000 cubic meters of water would require but 85 centimetres of chlorinated lime and about 40 of sodium sulphite.

Dr. Lane-Notter (*British Medical Journal*, August 18, 1894) experimenting with filters for potable water, shows that the Chamberland-Pasteur filter gives the best results. This and the Berkefeld act in the same way, sterilizing the water by filtering out all the germs, but producing no chemical changes. The Chamberland-Pasteur filter is harder, less brittle, and more readily cleansed than the Berkefeld. The former is made of fine China clay, the latter of infusorial earth. Both are easily cleaned by first washing and then passing the bougies over a Bunsen burner.

In 1867 there were 6881 cases of typhoid fever in the French army. In 1889, after the introduction of the Chamberland-Pasteur filter there were 4112; in 1890, 3491; and in 1891, 3225 cases, a reduction since 1867 amounting to 52 per cent.

Cholera Bacilli and Milk.

According to the experiments of Dr. Walther Hesse (*Zeitschrift für Hygiene und Infectionskrankheiten*, Bd. xvi., p. 238), fresh uncooked cow's milk is not only no culture medium for the bacilli, but in point of fact it exerts a destructive influence upon them. They begin to die as soon as they are mixed with it, and almost without exception when the milk was kept at the room temperature all were dead within twelve hours; at incubator temperature this period was shortened to six or eight hours. The age of the cultures, the nature of the culture medium, and the addition of some of the latter to the milk with the bacilli, are alike without influence on the results, and the destruction of the bacilli is independent of the degree of acidity of the milk. Milk exposed to steam for a time may, with the addition of an alkali, be converted to a culture medium, but not a good one.

GREEN STOOLS DUE TO BACILLUS PYOCYANEUS.

A REMARKABLE case is reported by SALUS (*Prager med. Woch.*, 1894, xix., No. 33) in which a green color was imparted to the feces by the growth in them of *bacillus pyocyaneus.* The patient, a woman twenty-six years of age, was obliged to undergo laparotomy for removal of a tumor of the ovary. In breaking adhesions the wall of the gut was injured, so that a fecal fistula formed at the lower angle of the wound. About two weeks after the operation it was noticed that the feces staining the dressing were green in color. Fresh bits of fecal matter were obtained (after careful washing of the wound) for bacterial examination, which disclosed in it large numbers of the *bacillus pyocyaneus* as shown by pure cultures and subsequent animal inoculations.

A case similar to the above is reported by KOSSEL (*Zeitschr. f. Hygiene u. Infectionskr*, 1894, xvi.) in which *pyocyaneus* was the cause of green diarrhœa in a child four weeks old.

CHOLERA BACILLI AND COLD.

EXPERIMENTING with different degrees of cold, MONTEFUSCO (*Giornale di Medicina Publica,* Anno xxiv., No. 5) found that a one-day-old culture of cholera exposed to a temperature of 10° to 15° below zero centigrade for a half hour was practically without influence on guinea-pigs; at the same time the bacilli were not killed, and when the original conditions were restored regained their virulence unchanged. Animals inoculated with the exposed culture remained immune.

Erratum —Vol. cviii, No. 6, p. 702, line 5, for *necrosis* read *narcosis*.

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FEBRUARY, 1895.

ON THE CULTIVATION OF THE GONOCOCCUS FROM CASES OF GONORRHŒA, OPHTHALMIA PURULENTA, AND PYOSALPINX.

By J. H. Wright, A.M., M.D.,
ASSISTANT IN PATHOLOGY.

(From the Sears Pathological Laboratory of the Harvard Medical School.)

The occurrence of a peculiar diplococcus in the pus of gonorrhœa and ophthalmia purulenta was first pointed out by Neisser[1] in 1879, and named by him the gonococcus. Since that time a great many investigators have studied this organism and its occurrence in various inflammatory processes. The results of this work have fully confirmed the opinion of Neisser, that the gonococcus is the cause of gonorrhœa and ophthalmia purulenta, and have further shown that it is to be found in the vulvo-vaginitis of children, in a certain proportion of cases of pyosalpinx and in some other inflammatory conditions of the genital organs of the female, as well as in some of the cases of endocarditis and arthritis secondary to gonorrhœa in the male. On account of the fact that the ordinary culture media are not suitable for the cultivation of the gonococcus, and because of the difficulty of preparing the special media required for its growth, most of this work has consisted solely in the microscopical study of stained preparations, the recognition and identification of the organism being rendered possible by its morphology, staining reactions, and position inside of the leucocytes.

While the positive identification of the gonococcus can probably be made by a practised observer, in most cases, from these considerations, yet as a method of investigation it is inadequate for at least two reasons:

first, because other cocci which resemble it may be mistaken for it; and, second, because it may be present, but escape observation.*

To confirm and supplement the results obtained by the microscope, the need of an easily prepared culture medium, upon which the gonococcus will readily grow, has long been felt, for by the aid of culture methods the presence or absence of this organism in pathological conditions and its identity might be determined with the same degree of accuracy as is done in the case of other bacteria.

The cultivation of the gonococcus has been attempted by a number of bacteriologists, few of whom have succeeded in obtaining undoubted cultures of it. The first to cultivate it was Bumm,[2] who obtained cultures on coagulated human blood-serum from the pus of gonorrhœa and ophthalmia purulenta. This investigator was also the first to produce a gonorrhœal urethritis by inoculation from a pure culture, and thus to prove beyond question the etiological significance of the gonococcus.

Wertheim[3] improved the culture method of Bumm by using a mixture of nutrient agar and human blood-serum, upon which the gonococcus was found to grow more vigorously than on the blood serum alone. The blood-serum was obtained under aseptic precautions, and mixed with melted agar at a temperature of 40° C. In this way he was enabled to prepare plate cultures, and thus to study easily the appearances of the colonies of the organism. It was cultivated by Wertheim from the pus of seven cases of pyosalpinx, two cases of ovarian abscess, and one case of peritonitis secondary to pyosalpinx. The identity of the coccus thus isolated was proven by the production of characteristic urethritis from the inoculation of the cultures from three of the cases. It also grew on media prepared with ox blood-serum, but the growth was less vigorous than on the media containing the human serum.

By the use of the method of Wertheim, Gebhard,[4] Risso,[5] and Menge[6] have also cultivated the gonococcus from gonorrhœal processes. Steinschneider[7] modified Wertheim's media by the addition of sterile urine to the agar and blood-serum mixture. Sterile human serum was used, which was obtained by venesection under aseptic precautions. The organism was cultivated from the pus of gonorrhœa, and its virulence demonstrated on the human urethra.

In all these media, blood-serum, preferably human blood-serum, free from bacteria, is an essential constituent. This fact has hitherto prevented the general use of any of them in the study of infections with the gonococcus, because of the great difficulties, not only of obtaining human blood in sufficient quantities, but also of obtaining the serum of either human or animal blood in sterile condition. Still more impracticable is the use of the plover's egg albumen of v. Schrötter and Winkler,[8] the knee-joint effusion of Aufuso,[9] and the ovarian-cyst fluid of Menge,[10] by means of which the writers named have cultivated the gonococcus. It has also been stated that a slight growth on plain agar and on glycerin-agar has been observed by Wertheim,[3] and this observation confirmed by Günther[11] for the latter medium. These observations seem, however, to be exceptional.

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* In many cases the staphylococcus pyogenes may occur in purulent collections in the form of diplococci enclosed in cells, and, while not agreeing in all respects with the gonococcus, may closely simulate it. Streptococci may also appear in the same way. In some cases so few organisms may be present that repeated cover-slip examinations may fail to reveal them.

Following in general the method of Steinschneider, during the first six months of 1894 the writer has cultivated from seven cases of gonorrhœal urethritis, eight cases of ophthalmia purulenta, four cases of pyosalpinx, and from one case of vaginitis in a child, a coccus which is in all respects identical with the gonococcus in its morphology, staining reactions, and cultural peculiarities. Although the effect of the inoculation of the human urethra with this coccus has not been tried, yet the organism is held to be the gonococcus for the following reasons:

First. The microscopical examination of the pus, made in most of the cases from which cultures were obtained, showed the presence of typical gonococci inside of leucocytes, and as the only or prevailing organism present.

Second. The growth, on the special media, from such pus, of colonies unlike the colonies of other pyogenic cocci; these, on microscopical examination, were seen to be made up of diplococci like gonococci in their mophology and mode of division.

Third. The fact that these cocci were decolorized by Gram's method of staining, which is a very characteristic peculiarity of the gonococcus.

Fourth. The failure, as a rule, of this coccus to grow on glycerin-agar when transplanted on to this medium from colonies which developed on the special medium; the gonococcus, according to the best authorities, either not growing at all or but to a very slight extent upon agar.

Fifth. The occurrence of one and the same coccus in all of a considerable number of cases of gonorrhœal infection.*

METHODS. The culture medium used was essentially that of Steinschneider, consisting of a mixture of urine, blood-serum, and nutrient agar. This mixture was contained in test-tubes in the form of "slants."

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* Since this paper was written Turro has reported in the Centralblatt für Bakteriologie und Parasitenkunde for July 2, 1894, the cultivation of the gonococcus on acid gelatin. The writer has not been able to confirm this.

No growth has been observed in the acid gelatin prepared according to Turro's directions and inoculated from colonies of the coccus here described. The same negative result has followed the inoculation of the organisms into agar rendered slightly acid by hydrochloric acid. In this connection it may be stated that Dr. William Royal Stokes, Resident Assistant Pathologist of the Boston City Hospital, has recently succeeded in isolating from gonorrhœal urethritis the same coccus described in this paper by the use of the coagulated blood-serum mixture of Lœffler rendered slightly acid. This medium is coagulated by dry heat in test-tubes in the form of "slants," and sterilized by steam, as in the case of ordinary culture media.

The method of preparation of the medium, however, differs from Steinschneider's in that, instead of collecting the blood-serum and urine under aseptic precautions and preventing their contamination, these constituents were collected without any special care whatever, and were freed from bacteria by filtration through unglazed porcelain. This filtration has been found to be perfectly feasible, and greatly lessens the amount of labor and skill required in preparing this culture material. Both human and ox-blood blood-serum have been employed, the latter evidently serving quite as well as the former. The details of the method are as follows, although they have been departed from at times in non-essential particulars:

A litre of nutrient agar (beef infusion) is prepared in the usual manner, and after filtration is evaporated to about 600 cc. This concentration is desirable, so that, after the dilution with the urine and serum, the medium may be sufficiently firm. This concentrated agar is then run into test-tubes, and the whole sterilized by steam three times. The quantity of agar placed in each tube is smaller than is usual, in order to allow for the subsequent addition of the urine and serum.

The blood serum, which need not be free from corpuscles, is first passed through white sand, which is supported in a funnel by filter-paper, in order to remove as much as possible any particles in suspension, and is then mixed with half its volume of fresh urine. The mixture of urine and blood-serum is next filtered by suction through an unglazed porcelain cylinder into a receiving flask, such as chemists use for similar purposes, by means of a water-vacuum pump.

This frees the mixture from bacteria.

The usual precautions are, of course, taken to prevent the contamination of the filtrate, such as the previous sterilization by steam of the cylinder and receiving flask, besides others which will occur to any bacteriologist.

The greatest difficulty which has been encountered has been the slowness of the filtration through the porcelain. This has been very satisfactorily overcome, however, by the use of a cylinder manufactured by the Boston Filter Company, through which the mixture ot urine and serum passes rapidly.

To the agar in each test-tube, which is fluid and of a temperature of about 40° C., there is added about one-third to one-half its volume of the filtered mixture of urine and blood-serum. This is conveniently accomplished by pouring the mixture from the receiving flask through the lateral tube, inserted near its neck, directly into the tubes. The melting of the agar is best effected in the steam sterilizer in order that any organisms which have found lodgment in the cotton plugs of the tubes may be destroyed. When the agar is melted it is cooled and kept fluid by placing the tubes in a water-bath at 40° C. Each tube, after the addition of the urine and serum to the fluid agar, is quickly shaken to assure a good admixture, and is then placed in a slanting position to allow the agar to become solid, and thus to form a slant. When the medium in the tubes has solidified the tubes are placed in the incubator for about twenty-four hours to test for contaminations, after which they are ready for use.

Over the surface of the culture medium thus prepared a small quantity of the pus is distributed and the culture placed in the incubator for development. At the same time a stained cover-slip preparation of the pus was examined in most of the cases. In some cases the material for examination has been secured and brought to the laboratory on a "swab," which consists of a piece of absorbent cotton wound on the end of a piece of stiff wire. This is carried about in a test-tube in which it has previously been sterilized by dry heat.

Biological Characters of the Gonococcus. After twenty-four hours in the incubator the colonies of the gonococcus appear on the urine-serum-agar as grayish, semi-translucent points, a fraction of a millimeter in diameter.

After forty-eight hours they may be about one millimeter or so in diameter, slightly elevated, with a rounded outline, grayish in color, and by transmitted light semi-translucent. By reflected light their surface has the appearance of frosted glass. Later, if few in number, so that their growth is unimpeded, the colonies may attain a diameter of two millimeters or more, become thicker and denser, with a faintly-brownish tinge about their centres and a slightly irregular outline.

Under a low power of the microscope a fully-developed colony is seen to consist of a generally circular expansion, with thin, translucent, smooth, sharply-defined margin, but becoming brownish, granular, and thicker toward the central portion, which is made up of coarse, granular, brown-colored clumps closely packed together.

The appearances coincide with the figure of such a colony given by Wertheim.[3]

In daughter cultures the colonies become confluent along the line of inoculation on the surface of the medium. As has been pointed out above, one of the important characteristics of the gonococcus is its inability to grow on nutrient agar, although some observers have noted a minimal development on this medium.

In the present work the growth, on glycerin-agar, of the coccus here described has been tested by transplantation from the colonies in a majority of the cases in which it has been cultivated. With two or three exceptions, in none of these cases was any development on the agar obtained. In the exceptional cases the growth which appeared was very scanty.

When transplanted onto coagulated ox-blood-serum (Löffler's mixture sterilized by steam) the organism grows in the form of minute colonies. This medium is not, however, to be regarded as suitable for its cultivation.

In morphology the coccus which has been cultivated from the cases detailed below is identical with Neisser's organism.

Under the microscope, in stained preparations from cultures, it appears as a diplococcus, somewhat larger than the other pyogenic cocci, composed of two hemispheres separated by a narrow unstained interval. Frequently two of these hemispheres are seen lying side by side in the manner of tetrads, and showing clear evidence that division occurs in two directions at right angles to each other.

As was first shown by Roux,[12] an important characteristic of the gonococcus, which has been alluded to above, is the fact that it is decolorized when treated by Gram's method of staining. In this it differs strikingly from other pyogenic cocci. The coccus here described has been found to lose its color in every instance in which it has been treated according to Gram's method, and this has been done in every case in which it has been cultivated.

The duration of life of the organism in cultures seems to be variable, apparently depending largely upon the quality of the culture medium used.

Although no extensive studies have been made of this point in the present work, yet, in general, it may be said that it seems to lose its vitality in cultures more rapidly than do the other pyogenic cocci, growth from a colony a week old or even less being uncertain. Wertheim, however, notes that a culture more than six weeks old retained its vitality, while Bumm found that the ability to grow in daughter cultures was lost after a few days.

GONORRHŒA. Most of the cultures from gonorrhœal urethritis have been secured through the coöperation of Dr. Abner Post, of Boston, at whose suggestion the experiments in the cultivation of the gonococcus were undertaken.

The writer is under many obligations to Dr. Post for the active interest which he has shown in the work. Of other cultures one was obtained from a case in the practice of Dr. W. H. Prescott.

From the pus of seven cases of acute gonorrhœal urethritis in the adult male characteristic colonies have been cultivated, which on microscopical examination were found to consist of cocci identical with gonococci in their morphology and decolorizing by Gram's method of staining.

The microscopical examination of the pus made in five of these cases showed the presence of the gonococcus in each as the prevailing or only coccus present. The colonies in five of the cases were numerous, being thickly crowded together over the surface of the medium. In one case they appeared in moderate numbers, and in another case but three colonies developed. In this last case very few gonococci were to be seen in the cover-slip preparation of the pus.

Other bacteria have also developed in these cultures, but their colonies are usually much smaller in number or develop more slowly than those of the specific cocci, so that they have caused but little annoyance.

Only cases of gonorrhœa of recent origin seem to be suitable for obtaining cultures of the gonococcus. Cases which have persisted for a considerable time are unfavorable for the growth of discrete colonies of the organism, because of the comparatively great number of rapidly-growing bacteria of various kinds which overgrow the surface of the medium.

It is worthy of note that one of the cases from which numerous colonies developed was certainly acquired through active pæderasty.

In addition to these cases of urethritis, through the kindness of Dr. James M. Jackson, a culture has been obtained from a case of vaginitis in a child of nine years of age. There had been a purulent discharge from the vulva during about a week before being seen by Dr. Jackson, who found the vulva inflamed and red, hymen injected but intact, and on opening the vagina a considerable amount of yellow pus exuding. No history of contagion or *stuprum.*

Microscopical examination of the pus showed numerous cocci resembling gonococci as the prevailing organism, only a few of which were seen inside of the leucocytes.

A small amount of the pus was spread over the surface of the urine-serum-agar "slant." On this, after twenty-four hours in the incubator, very numerous minute grayish, semi-translucent colonies appeared. These, on microscopical examination, were found to be composed for the greater part of cocci resembling gonococci in morphology, and apparently undergoing division in two directions. They were decolorized by Gram's method of staining. A few pneumococci-like bacteria were also present, but in inferior numbers.

From the culture two glycerin-agar tubes were inoculated. After some days in the incubator no growth at all could be seen in one of the tubes, while in the other it was doubtful from the appearances whether there had been any growth or not.

OPHTHALMIA PURULENTA. The gonococcus was first cultivated from this disease by Bumm,[3] and since, Gebhard[4] and Menge[6] have each cultivated it from single cases. In the present work it has been cultivated from eight cases.

Through the kindness of Dr. Henry H. Haskell, Resident Ophthalmologist of the Massachusetts Charitable Eye and Ear Infirmary, cultures have been obtained from five cases of ophthalmia. The writer is indebted to Dr. Haskell for some of the clinical notes on these cases:

Case I.—Child, aged six years, entered Massachusetts Charitable Eye and Ear Infirmary with history of sore eyes for about two weeks. Lids œdematous, profuse purulent discharge. Conjunctivæ of lids and globe much injected and chemosed. Cornea clear and not affected. Steady improvement under treatment. Clinically the case was doubtfully specific. Source of infection unknown. After two weeks discharge had ceased, no œdema of lids, no chemosis of conjunctivæ, globe white. Discharged.

On the seventh day after admission a culture was taken from the pus, and a moderate number of minute grayish semi-translucent colonies developed on the *urine-serum-agar*. These were found to be made up of cocci like gonococci in morphology and mode of division, and were decolorized by Gram's method of staining.

No growth from transplantation on glycerin-agar after some time in incubator.

A second culture was taken two days later, in which rather numerous colonies of the same coccus developed. In the appearance of its colonies, in its morphology, mode of division, and staining peculiarity, it was identical with the coccus which grew in the first culture.

No growth when transplanted onto glycerin-agar after three days in incubator.

No organisms were found in a cover-slip preparation of the pus of the second culture, stained by Gram's method, as was to be expected from the fact that the gonococci were decolored, if present.

If ordinary pus organisms had been present, they would have been stained, and therefore rendered visible.

A third culture was made, after another day, from the cloudy, watery discharge which was then occurring. Microscopical examination of this pus in a preparation stained in the ordinary way showed leucocytes and cocci like gonococci. No typical phagocytosis was seen. A few colonies of the same appearance, and made up of the same coccus as in the other cultures, developed on the surface of the culture tube. This coccus was like the gonococcus in morphology, mode of division, and reaction toward Gram's method of staining.

Transplanted onto glycerin-agar it failed to grow.

Case II.—Boy, aged ten years, entered the Massachusetts Charitable Eye and Ear Infirmary with a history of sore eyes for ten days. Purulent discharge, not abundant. Lids œdematous, conjunctivæ of lids and globe much chemosed and injected. Corneæ not affected. Steady improvement under treatment.

Discharged after about a week with eyes in good condition. Clinically the nature of this case was doubtful. Source of infection unknown.

On both the third and fifth days after entrance a culture was made from the pus.

In each tube numerous characteristic colonies of cocci developed, together with a few colonies of other bacteria in one of the tubes. The coccus grown on each occasion was like the gonococcus in morphology, mode of division, and reaction toward Gram's method of staining. Transplanted onto glycerin-agar there was no development in the case of one of the cultures, and in the other there grew two small colonies of the coccus.

A cover-slip preparation of the pus in this case showed typical gonococci, which were decolorized by Gram's method of staining.

CASE III.—Female, aged twenty-five years, married. Entered the Massachusetts Charitable Eye and Ear Infirmary with history of sore eye for about a week previously. Only one eye affected. Œdema of lids. Conjunctivæ of lids and globe much chemosed. Cornea perforated. Abundant purulent discharge. Infection from husband almost certain.

Two days after admission a culture was made from the pus, and at the same time a cover-slip preparation. The cover-slip preparation, stained in the ordinary manner, showed a few typical gonococci in leucocytes.

In the culture numerous characteristic colonies developed, along with a few other colonies.

The numerous colonies were composed of cocci like gonococci in their morphology, mode of division, and reaction toward Gram's method of staining, which did not grow when transplanted onto glycerin-agar.

CASE IV.—Infant. Massachusetts Charitable Eye and Ear Infirmary. Thick, purulent discharge from eyes; cover-slip preparation of the pus stained in the usual manner showed typical gonococci in leucocytes. No other bacteria noted as present. Stained by Gram's method the gonococci were seen to be decolorized.

In the culture made from the pus there grew very numerous characteristic colonies of cocci like gonococci in their morphology, mode of division, and reaction toward Gram's method of staining.

The coccus did not grow when transplanted onto glycerin-agar and ept in the incubator for some days.

CASE V.—Infant. Massachusetts Charitable Eye and Ear Infirmary. Purulent discharge from eyes. A culture from the pus developed numerous characteristic colonies of cocci, which were like gonococci in their morphology, mode of division, and reaction toward Gram's method of staining.

In a transplantation onto glycerin-agar, after forty-eight hours in the incubator, a very slight growth was noted. A few other colonies also grew from the pus.

CASE VI.—St. Elizabeth Hospital. The writer is indebted to Dr. James M. Jackson for this case and its history.

Female, aged fourteen years, abundant discharge of thick, creamy pus from one eye. Duration of disease but a few days at the time the material for cultures was secured, although there was a history of a sore eye for a month. Infant in family said to have had ophthalmia.

In the culture from the pus there developed numerous characteristic colonies of cocci, which were like gonococci in their morphology, mode of division, and reaction toward Gram's method of staining. They did not grow when transplanted onto glycerin-agar which was kept three days in the incubator.

No microscopical examination of the pus was made.

CASE VII.—Boston City Hospital. Infant, discharge from eyes of thick, yellow pus. A cover-slip preparation of the pus, stained in the usual manner, showed the presence of gonococci.

In a culture from the pus there developed about fifteen characteristic colonies of cocci, which were like gonococci in their morphology, mode of division, and reaction toward Gram's method of staining.

But one colony of another organism developed.

There was no growth of these cocci transplanted onto glycerin-agar after they had been forty-eight hours in the incubator.

CASE VIII.—Boston City Hospital. Infant, purulent discharge from eyes.

But few gonococci were found in the pus by microscopical examination. In the culture from the pus only two colonies developed. These seemed to be gonococci on microscopical examination, and were decolorized by Gram's method of staining. It is uncertain whether they grew on glycerin-agar or not.

PYOSALPINX.—The close etiological connection between certain of the inflammatory conditions of the pelvic organs of the female and gonorrhœa was first clearly pointed out by Noeggerath,[13] on clinical grounds alone, in 1872, and has been generally admitted for some time.

In pyosalpinx, gonococci were first observed with the microscope by Westermark,[14] in 1886.

By the microscopical examination alone they have since been found in salpingitis by Orthmann[15] in one of eight cases, by Schmitt[16] in one case, by Stemau[17] in one case, by Menge[18] in three of twenty-six cases, by Zweifel[19] in eight of forty-four cases, by Reichel[20] in one case, by Döderlein[21] in one case, and by Wertheim[3] in nine of twenty-four cases. In addition to these cases, Wertheim[3] has isolated it in cultures from seven cases, and Menge[10] from one case also. In all, about one hundred and eight cases have been recorded in the literature, which have been examined for the presence of gonococci, either by the microscope or by cultures, and in thirty-four cases, or 31 per cent., this organism has been found. Sixty-one of the cases were sterile or free from bacteria, and in but eleven of the one hundred and six cases were other bacteria than gonococci present.

In the present work gonococci have been demonstrated by cultures in four out of about twenty cases of pyosalpinx, or in about 20 per cent. Excluding one specimen, which had been in communication with the sinus in the abdominal wall, and another, in which there was tuberculosis, the contents of all the negative tubes were free from bacteria, both by cultures and by microscopical examination.

This result is in harmony with the experience of others referred to above. A large part of the material for study has been obtained through the kindness of Dr. James M. Jackson of the staff of St. Elizabeth Hospital, for which the writer desires here to make acknowledgment. The cases of pyosalpinx from which gonococci were cultivated are as follows:

CASE I.—Operation at St. Elizabeth Hospital, specimen brought to laboratory by Dr. Jackson. Tube enlarged and containing a considerable amount of thin pus. Cover-slip preparations of the pus showed the presence of gonococci, not numerous, but easily found. On the surface of the culture made from the pus there developed probably sixty characteristic colonies which were made up of cocci like gonococci in their morphology, mode of division, and reaction toward Gram's method of staining.

CASE II.—Operation at St. Elizabeth Hospital, specimens brought to laboratory by Dr. Jackson. One tube very much enlarged and tortuous and distended with pus. The other tube is smaller and also contains pus. Cover-slip preparations of the pus from the larger tube were negative for bacteria, but in one from the smaller tube one or two leucocytes containing gonococci were seen.

Four or five cultures were taken from the contents of these tubes, in all of which a moderate number of characteristic colonies developed. Transplantations from these colonies into four glycerin-agar tubes resulted in no growth.

CASE III.—Operation by Dr. Burrage at the Carney Hospital. Both tubes contained pus. In the pus of one of them gonococci were seen by the microscope. In a culture made from the pus of one of them three or four characteristic colonies and one or two fluorescent colonies developed.

The characteristic colonies were composed of cocci, like gonococci in morphology, which were decolorized by Gram's method of staining.

CASE IV.—Operation by Dr. Mixter. The walls of the tubes were somewhat thickened and there was a small amount of pus in the interior. In a culture made from the pus a moderate number of characteristic colonies of cocci developed. These cocci were like gonococci in their morphology, mode of division, and reaction toward Gram's method of staining.

No growth in a transplantation onto the glycerin-agar after forty-eight hours in the incubator.

A cover-slip preparation from the interior of the tube made after the specimen had been about one day in Müller's fluid was negative for bacteria.

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CYLINDROMA ENDOTHELIOIDES OF THE DURA MATER CAUSING LOCALIZING SYMPTOMS AND EARLY MUSCULAR ATROPHY.

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AND

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Spreading paralysis on the right side, commencing in the shoulder; Jacksonian epilepsy; absence of all the classical brain tumor symptoms; early amyotrophy without spinal lesions; change of electric reaction; operation; death.—(Dr. Carson.) P. McH., aged forty-six years, born in Ireland, resident of Kansas, occupation horse-trainer, gives the following history:

General health always good with the exception of chills and fever at various times six or seven years back. Always led an active life, and excelled in athletic sports. A little more than a year before the beginning of the present trouble he was thrown from a buggy and dragged about thirty yards. Was not conscious at the time of an injury.

One day, about six months before presenting himself for treatment, he noticed a weakness in the right shoulder, when, with some companions, he attempted to vault a fence. On repeated examinations he found that, while the shoulder and arm were decidedly weak, the elbow-joint and wrist were still performing their functions, and the grip of the hand and the movement of the fingers were not impaired. One month later the arm became so weak and unsteady, and a few weeks later the grip of the hand so unreliable, that he was compelled to discontinue shaving himself. The whole arm and hand felt at times numb (sleepy), and the arm seemed smaller. At this time he sought medical advice from a local physician. Treatment (chiefly bromides and galvanism) was of no avail, and was, therefore, soon abandoned. For several months the impairment of power and the "numbness" continued to increase.

Electrical treatment was resumed by his physician, the faradic current being applied to the affected member. This application was immediately followed by a spasm commencing in the index and middle fingers, which were flexed upon the palm, the thumb being thrown into the palm; then the spasm extended to the wrist, flexing it; then to the arm, flexing it and drawing it near to the chest. All of the flexed muscles of the fingers, hand, forearm, and arm to the shoulder were involved. The spasm was unattended with loss of consciousness, lasted about two minutes, and resisted all attempts at reduction. Such attempts caused much pain and had to be discontinued. The arm remained absolutely useless for at least an hour afterward, when it gradually resumed its former condition.

Again, during the afternoon of the same day, he had a second spasm, a counterpart of that in the morning. During the time that elapsed from the first attack to his entrance into the hospital, about three months, he had at varying intervals nine spasms of different intensity, but in all essentials like the first one. Some of them, he thought, had been shortened by forcibly extending the fingers, their starting-point, when the first indication of return was felt. Ten days before entering the hospital he had the last attack. This was more severe than any of the others, extending from the arm into the face, closing the eye, twisting the leg as it had done the arm, and lasting about ten minutes. There had been *no* headache, vertigo, nausea, pain or suffering of any kind, nor impairment of sight, nothing to indicate that his general health was failing.

Status Præsens. At the time of entering the hospital examination revealed the following conditions: Appearance robust, body well nourished; all the faculties of the mind intact; patient is intelligent, far above the average of his class; no external evidence of injury; the left side of the head slightly larger than the right, and somewhat hypersensitive a little below and anteriorly to the left parietal eminence. The right arm completely paralyzed and the right leg paretic. Measurement shows the right arm ten and one-half and the left twelve inches in circumference. The right forearm one half inch less than the left. The right thigh is one inch and the right leg one-quarter inch less than the left. There is slight paresis of the face on the right side. All the tendon-reflexes on the right are exaggerated and foot-clonus well marked; slight spasticity in triceps of right arm; sensation and muscle sense not at all impaired. Patient is left-handed.

Examination of the eyes made by Drs. Pollack and Wolfner, of this city, independently of each other, did not reveal any abnormalities except an engorgement of the retinal veins. Accommodation and acuity of vision were perfect. There was no choked disk. The diagnosis was: Tumor of the brain, left hemisphere, involving principally the finger, wrist, and arm-centres. Since the trouble was evidently progressive, an operation was decided upon. The absence of headache, vertigo, nausea, and choked disk could not invalidate the diagnosis, which was rendered very probable by the characteristic spreading of the paralysis and the typical Jacksonian epilepsy.

The usual preparation for aseptic operation having been made, and, after chloroforming the patient, the flap having been raised in the customary manner, a button of bone was removed with an inch-trephine from the marked point, a little behind and below the middle of a line corresponding to the Rolandic fissure. Before the bone was entirely cut through there was profuse hemorrhage, which at first was supposed to come from the dilated vessels of the diploë. Another disk was removed anteriorly and a little above the former, and the two openings thus made were united by removing the intervening bridge of bone with a chisel. The hemorrhage from the entire circumference of the cranial opening was alarming, and, in order to control it, the opening had to be packed with gauze while the rongeur forceps were being used to enlarge the operative field. The copious bleeding was subsequently found to be caused by the immense size of some branches of the posterior middle meningeal vein, which, through excessive dilatation and subsequent corrosive (osteolytic) action, had converted the grooves in the skull into deep and broad channels, and it was not until the bone, including the large vessels, had been removed that the hemorrhage could be controlled.

Upon the removal of the bone the dura bulged into the opening and presented a dark, congested appearance, being covered with many and large gorged vessels. There was neither to be seen nor felt the least indication of pulsation. Upon attempting to raise the dura it was found to be adherent to a growth beneath, which was now plainly visible and, while it was soft and friable, was easily lifted from its bed between the dura and the apparently healthy brain. The dura, that part of it involved in the tumor, was cut out and the cavity left loosely packed with gauze, the flap replaced, and held by a fine silk-suture, the wound dressed, and the patient returned to bed in a bad condition on account of shock and the considerable loss of blood.

During the course of the operation injections of whiskey, aqua ammonia, and ether, had been administered by one of my assistants to prevent collapse.

The tumor, at the time of removal, was three and one-half inches long, three inches wide, one inch thick, and weighed fourteen ounces.

Patient seemed to be getting along satisfactorily during the first three days after the operation. There was dulness of sensation on the right side, which, however, seemed to have completely disappeared on the third day. The paralysis of the arm also seemed to improve, when, on the fourth day, the patient showed a brown, dry tongue, and was slightly delirious. Abscesses had formed at the sites of the hypodermatic injections on the right arm. They were opened, and the cavities cleaned with peroxide of hydrogen. After this the case progressed favorably until the twelfth day, when fever and a grave delirium, bordering at times on maniacal wildness, set in.

On the same day he had a spasm which involved the whole right side and left him unconscious. He never rallied from this, and died seventeen days after the operation. The temperature never exceeded 101.2°.

Remarks by Dr. Bremer.

Autopsy. The wound is united firmly throughout. The scalp appears sunken at the site of the operation. Upon the removal of the calvarium the dura mater is found strongly adherent to the bony edge of the trephine opening. The scalp is united to the underlying brain-substance (the dura having been removed at this place). No sign of a suppurative process. The dural vessels posteriorly to the operative field are congested and tortuous; the same is true of the corresponding portion of the pia. The margin of the dura is considerably thickened, and, as already stated, adheres firmly to the adjacent cerebral matter.

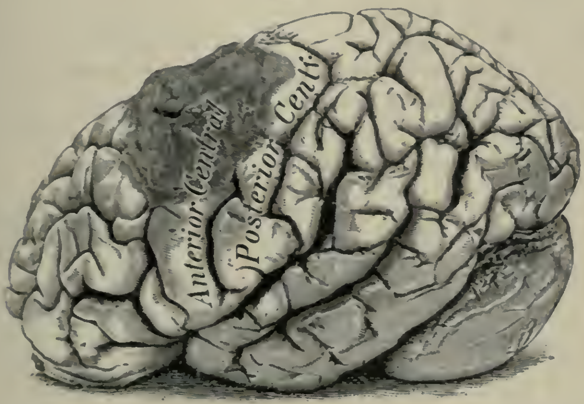
The brain surface presents an irregular, shallow defect in the nature of an erosion (Fig. 1) nearly circular in form, about two and one-half inches in diameter. It is of a pale-reddish color, and looks roughened, shreddy, and lacerated.

Toward the longitudinal sinus it is with greater difficulty than is usual under normal conditions that the dura mater can be separated from the subjacent tissue; a white mass about the size and shape of a split butter-bean is observed growing from the dura mater anteriorly to the defect. (This formation is recognized as being a remnant of the tumor which had escaped removal at the operation.)

There is a clot, not adherent, extending between the lesion and the longitudinal sinus, reaching backward over the superior parietal lobule for about two inches. The right hemisphere and the under surface of the brain do not offer any abnormalities, except that the basilar artery is greatly engorged.

The main area involved by the erosion is the greater portion of the upper two-thirds of the ascending frontal convolution and the foot of the first frontal; superiorly it commences about one-half inch from the longitudinal fissure, and extends downward to within two inches of the fissure of Sylvius. It involves the entire breadth of the ascending frontal and encroaches anteriorly on the first and second frontal convolutions, and posteriorly on the posterior ascending, which it displaces backward.

FIG. 1.



From a photograph of the brain hardened in Müller's fluid, showing the extent of the tumor. To make it appear plainer, the edges have been marked. It can be seen that the posterior central is dislocated backward. The tumor seems to reach up to the great longitudinal fissure, which, in reality, is not the case. The space between the upper margin of the tumor and the fissure is invisible, owing to the profile view.

On making a frontal incision at the site of the lesion the underlying structure on the cut surface appears reddish-brown for about an inch or an inch-and-a-half downward, shading gradually into the apparently white normal substance beneath.

The opinion prevailed at the time of the operation that the tumor had been radically removed, it being impossible to feel any remnants as far as the finger could reach with safety. Moreover, the brain seemed to be, aside from an easily comprehensible paleness and a flattened appearance of the convolutions, absolutely healthy. It was hoped, therefore, that in spite of the size of the tumor, the brain at the site of the depression would gradually resume its normal relations and functions.

This hope was not realized. Before the operation had been completed the cavity left by the removal of the tumor had been filled out by the underlying previously-compressed brain-mass, a process which, owing to its rapidity, could not very well have been accomplished without some hemorrhage into the substance of the brain.[1] Many hemorrhagic foci of varying sizes were indeed found on closer examination in addition to the other changes to be described later on.

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[1] It seems that even the most careful handling of the healthy, or apparently healthy, brain, such as cautious palpation, is invariably attended with hemorrhage, especially into the cortical substance, owing to the extreme thinness and vulnerability of the cerebral capillaries. This I was able to demonstrate in a specimen of apparently healthy cortex excised at the "wrist-

But, above all, the unremoved portion of the tumor on the visceral side of the dura would have precluded any possibility of a permanent cure, the tumor-mass gradually flattening out toward the healthy portion of the dura, and, after the manner of malignant growths, imperceptibly merging into the healthy tissue. Anteriorly to the opening in the dura the remaining mass was largest. Its thickness did not, however, taper off smoothly and evenly toward the periphery, but there was a terrace-like appearance, recalling the successive formation of the strata of ice seen around water-pumps in winter. The tumor, therefore, gave the impression of a miniature mountain planted with a broad base on the visceral layer of the dura mater.

Macro- and microscopic examination. The organs examined were the lungs, part of liver, kidneys, spinal cord, and brain. The following is the finding:

The lungs are gorged with blood. Second stage of croupous pneumonia. Liver much swollen, distinct lesions not demonstrable. Kidneys very much enlarged, cortical layer pale and thickened, medullary gorged with blood. Epithelium in many places degenerated and shed. Casts in all parts of the organ; some of them pigmented. Many hemorrhagic foci.

Spinal cord. There is macroscopically no demonstrable lesion of the cord, except a defect around the central canal, which, however, is looked upon as an artefact, due to maceration in the preserving fluid and possible rough handling during removal. Microscopically, however, this region shows a considerably greater amount of round cells around the canal than is normal, pointing to an irritating process. This extends down to the lumbar enlargement.

Very careful investigation is made as to the presence of a descending degeneration of the cortico-muscular tracts. The cervical enlargement especially is scrutinized owing to the striking atrophy of the right arm. Specimens prepared after Weigert do not show the slightest trace of any degenerative processes of the tracts mentioned nor of any nerve fibres in other fields of the section.

The large ganglionic cells of the anterior horns are on the whole intact, especially the peripheral ones. Some, however, of those lying more toward the centre of the horn show signs of degeneration (loss of processes and impairment of tinctorial capacity), not extensive enough, however, to account for the pronounced atrophy existing in the arm. At any rate, there is no difference in the extent of degeneration between the left and right anterior horns, which would be expected to be the case if the atrophy had been dependent on an anatomic change of the ganglionic cells. Besides, wasting of a small number of these cells nearing the age of fifty is, I think, physiologic.

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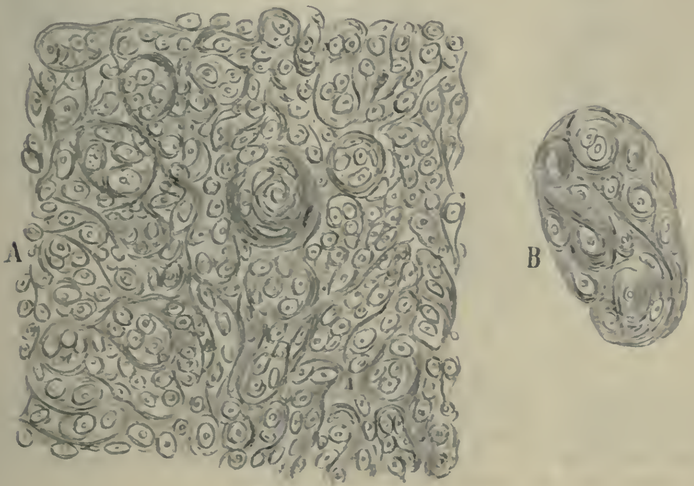
centre" in a case of cortical epilepsy. Although great care had been taken by the operator, Dr. Prewitt, of this city, to avoid any undue pressure, innumerable minute capillary hemorrhages could be demonstrated microscopically throughout the excised piece of normal cortex and, to a less extent, the underlying medullary portions.

Microscopic description of the tumor. The tumor is a cylindroma endothelioides. The term cylindroma comprises a variety of tumors, and, reading up on this subject in the text-books, Ziegler's *Pathological Anatomy*, for instance, one does not get a very clear idea of the matter. By it are meant several kinds of growths having in common cylinder-like bodies of a hyaline or gelatinous nature. Most of them belong to the class of the sarcomata. So does our tumor. I have called it cylindroma endothelioides, because the tumor in the main mass and fully-matured state is an endothelioma containing the cylindroid masses mentioned. It might, in the present unsettled state of nomenclature, also be called endothelioma cylindroides or sarcomatodes, or, as we shall see directly, angio-sarcoma cylindroides.

The tumor is, indeed, somewhat of a pathologic mine of wealth. It represents an astonishing variety of the phases of sarcoma development.

FIG. 2.



Müller's fluid carmine.
A. Typical endothelioma from fully-developed portion of the tumor. (HARTNACK, 3, vi.)
B. The same with higher amplification. (HARTNACK, 3, viii.)

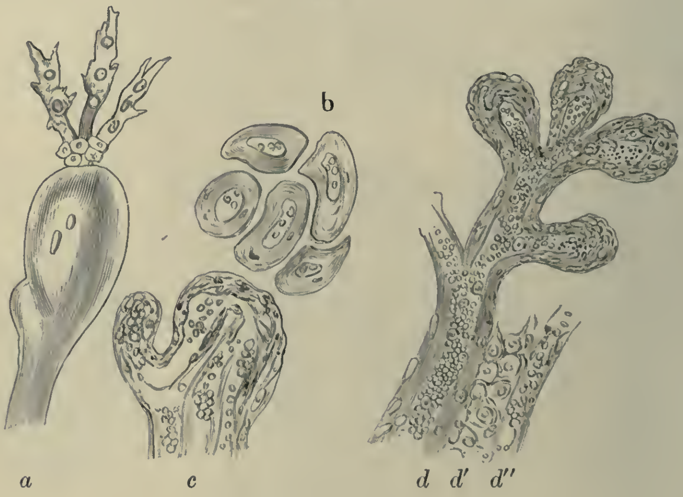
While, as stated before, the main mass is clearly made up of flattened or elongated cells which, after the fashion of epithelial growths, press upon each other, showing sometimes the well-known onion-like arrangement so characteristic of the epitheliomata, even the "pearl," nothing of this sort is seen in other parts of the tumor.

Nearly all the varieties of sarcomata may be encountered in or near the tumor-mass: the large oval-celled, net-celled, myxo- and angio-sarcoma.

The origin of the cylinder-like hyaline mass is a still debated question among pathologists. Some, I believe the majority of authors on the subject, have claimed that such originate in vessels undergoing a hyaline change. There can be no question about this in our case. The vessels are plainly seen in the process of the change. This plainness is probably due to the fact that the tumor is of recent growth. In another tumor of the same kind which I had an opportunity of examining, and which was of several years' growth, this connection between the hyaline masses and the vessels and the tumor could not be demonstrated.

In our tumor there is not only a number of vessels undergoing this process and still showing blood corpuscles in their lumen, but the general aspect of the hyaline masses at once suggests their origin.

FIG. 3.



Isolated vessels of the tumor.

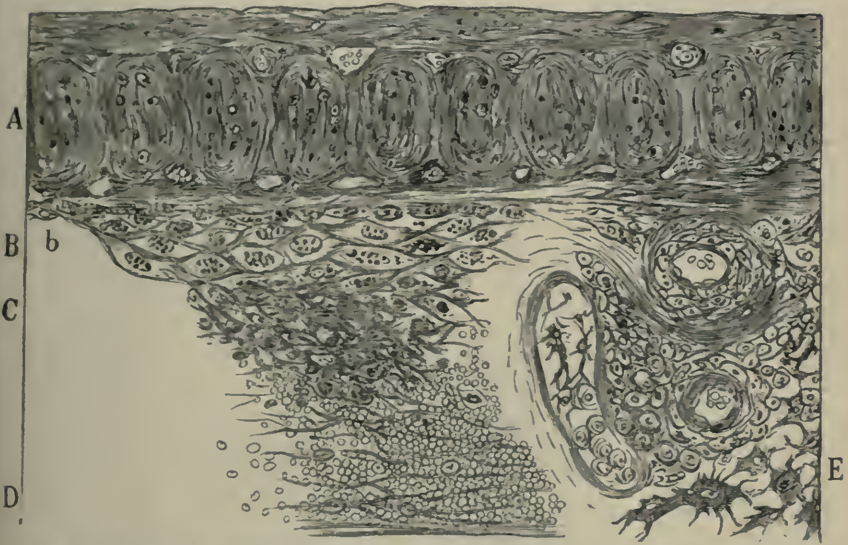
a. A vascular bud in complete hyaline degeneration; at the top some isolated net cells of the tumor proper. *b.* Cross-section of a bunch of vessels with partially hyaline walls. *c.* Cactus form of growing vessels. *d.* The same with typical buds. To the right of the vessel are cells closely packed (*d′*), and a small capillary (*d″*). Small granular hæmoglobin-containing bodies are seen in the lumen of the buds on the right.

Endothelial and angiomatous beginning of the tumor. Whilst, as above stated, oval and net-celled forms are found, the chief interest centres in two genetic features encountered in the case. Since the literature on this subject is not accessible to me, and as I am wholly restricted for information to the text-books (Ziegler, Birch-Hirschfeld, Klebs), I do not know whether the facts which I am going to state have been previously observed or not.

At places quite distant from the seat of the tumor, in the dura mater, for instance, an inch from the margin of the remains of the tumor spoken of before, dural vessels are found, which show an enlargement of all of their elements. Arteries may be seen in which the endothelia and also the smooth muscle fibres are enormously enlarged. The same picture is often observed in the part of the brain which after the operation was invaded by the growth. The endothelium seems to grow more actively, however, than the other constituents of the vessel, and soon the lumen is plugged with swelled-up endothelial cells, which in the course of time become flattened against each other.

Vaso-formative and hæmopoietic cells. Whilst thus the tumor spreads and invades the neighboring tissues by starting the endothelium of preexisting vessels to proliferate, a different genetic factor may be observed in other parts. While examining the parts of the tumor not removed by the operation and the neighboring dura mater my attention was engaged by a vascular layer extending from the flattened tumor-remnants for a considerable distance underneath and along the dura mater.

FIG. 4.



A. Parietal (supra-arachnoidal) layer of the dura, showing a row of connective-tissue bundles cross cut. Vessels and lymph-spaces are seen along the upper and lower margins. B. Strata of pigmented cells, vaso-formative and hæmopoietic, starting from b, a piece of normal arachnoidea. C. Layer of capillary and blood transformation. D. Change to capillary angioma. E. Net-celled sarcoma from another portion of the dura. (HARTNACK, 3, vii.)

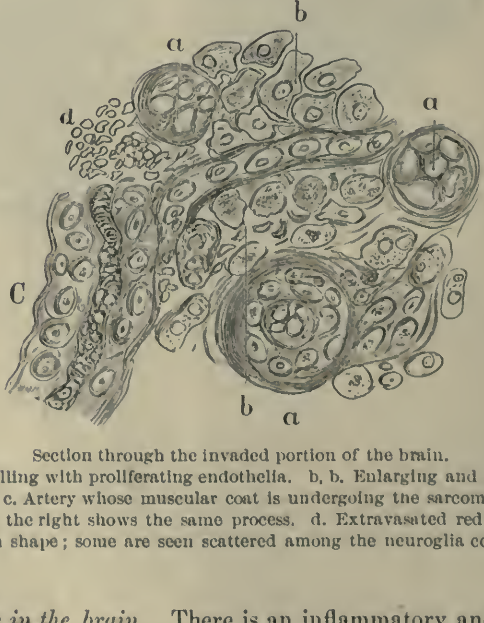
The chief interest centred in a layer of varying thickness of large spindle- or oval-shaped cells (Fig. 4) containing yellow granules. The cells gradually lose the yellow color, become larger, and on section represent a network with spindle-shaped spaces containing blood corpuscles. The spaces enlarge, and appear now as capillaries, the beginning of the sarcoma or angio-sarcoma. Those cells carrying pigmented granules seem to arise from the arachnoidea. I take them to be vaso-formative and hæmopoietic cells.

The blood, then, is formed *in loco*, together with the capillaries, a proposition which becomes at once a little more plausible and more easily intelligible when we remember that the sarcomatous process is a counterfeit of embryonic connective-tissue formation, and that this process has been demonstrated by Ranvier in the tail of the tadpole.

In the recently-formed portions of the tumor vessels in the act of growing and new formation can be satisfactorily seen. This new formation is, of course, unlike that described for the angiomatous development from the dura and arachnoid. The walls of the vessels are thick, but transparent and frail. New vessels are formed by budding, and the new formation of blood-corpuscles seems to take place *pari passu* with that of the vessels. In these newly forming vessels, too, I have seen hemopoietic cells. They are not pigmented, however. The older hyaline vessels often resemble cactus, because of their clumsy branches. (See Fig. 3.)

The new formation of vessels and of blood in them is, however, not the only way of inaugurating the angiomatous process. In many parts of the dura I saw, besides the vascular proliferation, the filling up of lymph spaces with blood. Again, blood will take the place of solid connective-tissue, melting, as it were, the intercellular substance, whereas the cells would appear constituting meshes in which the blood circulated.

FIG. 5.



Section through the invaded portion of the brain.

a, a, a. Vessels filling with proliferating endothelia. b, b. Enlarging and proliferating cells of the neuroglia. c. Artery whose muscular coat is undergoing the sarcomatous change. A capillary vessel to the right shows the same process. d. Extravasated red blood-corpuscles, some crescentic in shape; some are seen scattered among the neuroglia cells. (HARTNACK, 3, viii.)

The changes in the brain. There is an inflammatory and a neoplastic process demonstrable in the part of the brain nearest the former site of the tumor. I have no doubt that the injection of ammonia into the arm during the operation and the subsequent suppuration had a great deal to do with the rapidly fatal termination of the case, although it must be admitted that the post-mortem findings were such as to preclude any possibility of complete recovery.

The surface of the brain was invaded by two kinds of micro-organisms—one a large coccus, the other a short, thick bacillus with rounded ends. No cultures were made, and a diagnosis is impossible.

Besides the inflammatory changes all the varieties of sarcomatous processes could be shown in even greater variety than in the membranes. Almost every field under the microscope reveals different pictures; the pathogenic scenery is constantly changing.

The changes occurring in the other organs—lungs and kidneys—were due to the infection caused by the hypodermatic needle.

Motor or sensori-motor area. The divergence of opinions as to the true functions of the central convolutions is as wide to-day as it was fifteen years ago. The most radical assertion on the subject has of late years been made by Flechsig and Hösel,[1] who claim that the so-called motor zone of the brain is at the same time the sensory centre (resp. reflex centre) of the posterior spinal columns, on the ground of embryologic and anatomo-pathologic findings. However, from the description given by these authors, it is evident that it is principally the *posterior* central convolution which is in anatomic relation with the sensory tracts of the spinal cord, an observation which fits in well with the clinical observations of neuro-surgery. These latter speak certainly a more emphatic language than embryologic researches of anatomic findings based on cases of long standing, especially if the lesions date back to childhood, as in the case of Flechsig and Hösel (porencephalic defect of fifty-two years' standing).

Our case flatly contradicts the theory of the sensori-motor character of the Rolandic region, in the sense that every motor area is at the same time the sensory cortical termination of the corresponding segment at the periphery of the body. It is, in its bearing on the question, well supplemented by a case published by Darkschewitsch,[2] who reports a monoplegia of the right arm due to circumscribed tubercular softening of a portion of the *centrum ovale* (left side) corresponding in the main to the middle third of the posterior central convolution. There were paralysis and greatly diminished sensibility of the right arm. No atrophy. The conclusion, then, to be drawn from the findings of our case and the one just mentioned would be that, so far as the middle third of the Rolandic region is concerned, the anterior portion is exclusively motor, the posterior chiefly sensory in function. Of the two, ours is the more telling and pronounced, owing to the exclusive involvement of the motor function. The diagram drawn by Darkschewitsch shows an encroachment of the lesion on a portion of the anterior third of the central at about the level of the tumor in our case. The question would at once become much clearer if an exclusively sensory disturbance due to cortical lesion could be demonstrated. This, to my knowledge, has not been done so far.

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[1] Die Centralwindungen, ein Centralorgan der Hinterstraenge. Neurol. Centrbl., 1890, p. 417.

[2] Zur Frage von den Sensibilitätsstörungen bei Herderkrankungen des Gehirns. Neurol. Centrbl., 1890, p. 714.

Outspoken sensory disturbances were also absent in a case of a large tumor to be detailed later on, reported by Pel, and one published by Dr. Mudd.[1] In the neurologic report, which I furnished for this case (echinococcus the size of a large hen's egg growing in the Rolandic region), I forgot to mention the fact that sensibility was intact, as ascertained by Dr. Fry and myself.

Import of the localizing symptoms. The clinical report says that the first manifestation of the developing disease consisted in the sudden appearance of weakness in the right shoulder and arm, the grip of the hand and the movements of the fingers being unimpaired. This monoparesis of the shoulder and arm was not transitory, but lasting. It was, therefore, of the highest possible localizing value.

According to Putnam,[2] monoplegias and paresis are of greater localizing value than monospasms and localized convulsions. The shoulder was first paralyzed. The probability, then, is that the starting point of the tumor was anteriorly to the anterior central convolution at the junction of the foot of the first and that of the second frontal convolution (shoulder centre), and that from this point it grew and spread back-up-downward. In the sequence, as the arm, wrist, and finger centres were pressed upon, the paralysis moved from joint to joint, a striking illustration of the distinctness of the various cortical areas controlling distinct sets of muscles which are wont to work together in harmony toward executing a certain movement. The spastic seizures, however, took place in the reverse sequence, beginning in parts last attacked, viz., the fingers. This is also in keeping with our knowledge about irritative lesions and their manifestations. In the light of the clinical history, as well as considering the actual state of the patient, no importance could be attached to the fact that the spasms began in the fingers. In view of the overtowering paralysis of the shoulder, the initial spasm of the fingers was of no localizing value, and could not be looked upon as a signal symptom from an operative point of view.

Absence of optic neuritis. The percentage of the cases of intra-cranial tumors in which double optic neuritis occurs has been variously estimated. That a case of suspected brain tumor becomes at once doubtful whenever this symptom, the most unequivocal and best known of intra-cranial growths, is found to be wanting, is almost an axiom in brain pathology. The strongly localizing symptoms, however, in our case could leave no doubt as to the existence of an intra-cranial tumor belonging to the minority, in which papillitis is wanting.

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[1] AMERICAN JOURNAL OF THE MEDICAL SCIENCES, 1892, vol. ciii. p. 412.

[2] Intra-cranial Lesions. Transactions of the New York Medical Association, viii.

This is not the place to discuss the causes which lead to the production or prevention of optic neuritis in brain tumor; but it may not be amiss to point out the fact, exemplified once more in our case, that of all brain tumors not accompanied with papillitis, those of the large hemisphere and especially those occurring in the anterior portion of them, stand as to numbers at the head of the list.

Probably, also, the fact that the growth was not a brain tumor proper, and that, therefore, there was no irritating substance generated, which by some (Leber and Deutschmann), in addition to increased intra-cranial pressure, are held responsible for the production of papillitis, may partly account for the absence of this complication. Bramwell[1] remarks that in most of the cases of intra-cranial tumors in which optic neuritis is absent there is little or no evidence of increased pressure. This certainly applies fully to the case under discussion. There was neither hydrops internus nor distention of the sheaths of the optic nerves.

Absence of other classical symptoms of brain tumors. Besides optic neuritis, the strongest link in the chain of evidence establishing the diagnosis of cerebral tumor, the other characteristic symptoms were absent. There was no headache, vertigo, nausea, or vomiting, nor was there any mental hebetude or change of character.

The absence of headache in case of an intra-cranial growth of almost the size of a hen's egg may seem strange at first sight; but it becomes more plausible when it is remembered that there were no symptoms of any increase of intra-cranial pressure, notably no optic neuritis. For the same reason nausea and vomiting failed to set in, whilst vertigo is quite frequently absent in cases where the frontal region of a hemisphere is the seat of the lesion. All these symptoms were also absent in a large echinococcus cyst, reported by Mudd, and in Pel's case, referred to at another place. The spreading of the spasm to the face and mouth during the last attack of Jacksonian epilepsy showed how near Broca's convolution the disturbance had come. In spite of the relative remoteness of the tumor from this region, aphasic symptoms, by way of distant effect, would probably have manifested themselves had it not been for the fact that the patient was left-handed, and that therefore his speech-centres were on the right side of the brain. For the same reason there was no mental change, which, considering the size of the tumor-mass, would in all probability have shown itself if the patient had not been right-brained.

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[1] Intra-cranial Tumors, p. 58.

Mechanism of the production of the destroying and irritating symptoms. The paralysis of the shoulder was the first symptom to set in; convulsions followed later on. This seems to be in keeping with the nature of the existing pathologic process. The pressure from the gradually-enlarging tumor caused probably at first a wasting of the underlying gray and, possibly, white substances, due principally to persistent anæmia. The discharging lesion which supervened in the course of time was probably the result of hemorrhages into the neighboring cortical and subcortical tissues.

Practical localization. Owing to the fact that a mono-paresis of the shoulder was the first symptom to appear, the inference is, that the starting-point of the dural tumor was over the shoulder-centre. Since, however, at the time the patient presented himself, the whole arm was paralyzed and involved in the spasm, the region of the skull corresponding to the middle third of the Rolandic region was selected as the site for operative interference. This anticipation was justified by the result. However, the beginning of the growth was probably at the shoulder-centre—*i. e.*, the foot of the second frontal convolution.

FIG. 6.

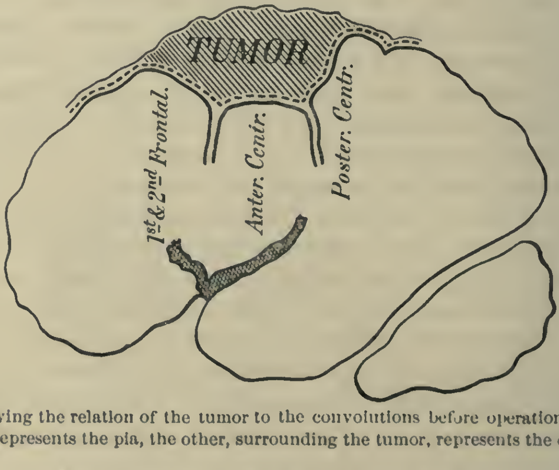

Diagram showing the relation of the tumor to the convolutions before operation. The dotted line represents the pia, the other, surrounding the tumor, represents the dura.

Statistics of cerebral muscular atrophy. There was prominent atrophy of the extremities of the left side. The muscles of the shoulder, notably the deltoid, supra- and infra-spinatus, were wasted. Muscular atrophy due to cerebral disease was first described by Todd.[1] Since then about twenty-one cases (most of them in late years, the present one included) have been registered and described, a remarkably small number considering the great prevalence of cerebral paralysis and the undoubted connection between muscular atrophy and brain lesion.

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[1] Clinical Lectures on Paralysis, 1854.

Among the eighteen cases collected by Steiner[1] fourteen were due to causes other than neoplasms (hemorrhage, softening, inflammation, abscess), six were cerebral tumors, two, the last ones reported (Pel's and ours), were extra-cerebral, meaning meningeal growths.

Literature on cerebral amyotrophy due to brain tumors. Among the cases of cerebral muscle atrophy due to brain tumors I find the following mentioned in the literature: 1. Roth and Muratow,[2] glio-sarcoma gyri centr. dextr.; left arm atrophied. 2. Patella,[3] glioma corticis dextr.; left arm, small hand muscles, and left leg atrophied. 3. Quincke,[4] glioma gyri centr. dextr. utriusque. 4. Borgherini,[5] metastatic sarcoma gyri centr. sinistr. 5. Pel,[6] fibroma of meninges, over gyri centr. sinistr.

Our case would make the sixth in the literature on this subject. It may be that I have overlooked some cases, but those in which authors have laid stress on this unusual symptom are, I think, all included in this list. Probably lesser degrees of atrophy have been overlooked in similar cases. I believe that, by paying closer attention to this feature, a greater number of such cases would be recorded.

Muscular atrophy due to extra-cerebral lesion. The chief interest of our case, so far as the muscular atrophy is concerned, centres in the fact that the exciting cause was, strictly speaking, extra-cerebral; that it was a growth of the meninges and that by mere pressure, and probably wasting, of the cortex atrophy and electric change of reaction, to be spoken of later on, were brought on. There is only one case extant, published recently, in which features analogous to those observed in our case are described. Pel[7] details the history of a case in which, as in ours, the most striking, most important, and most constant symptoms of brain tumor (headache, nausea, vomiting, vertigo, optic neuritis) were absent although the brain mantle was compressed by a tumor the size of an egg. The paresis was on the right side. There was mental impairment. (It is not stated whether patient was right- or left-handed.) There was Jacksonian epilepsy, slight atrophy of the muscles of arm and leg. Complete intactness of sensibility and muscle-sense. Electric reaction normal. The tumor, about the form of a chestnut (probably horse-chestnut, as in our instance), was found over the arm-centre, flattening but not invading the convolutions beneath. It was a fibroma traversed by large lymph spaces growing from the pia mater.

Another remarkable case of early muscular atrophy, not mentioned by Steiner, also due to extra-cerebral lesion, is that of a traumatic injury of the skull (fissure) corresponding to the anterior half of the upper parietal lobule, reported by J. R. Logan.[1] There was, besides a paralysis of the corresponding foot and leg (exclusive of the hip), a marked atrophy of the muscles of the calf.

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[1] Aus. de patholog. Inst. in Heidelberg. Deutsche Zeitschr. f. Nervenheilkunde, 1893, iii., 4. u. 5.

[2] Archives de Neurol., xxi. p. 296.

[3] Delle atrofie musculari secondarie, Padova, 1886.

[4] Deutsch. Arch. f. klin. Med., 1889. vol. xxxv. p. 371

[5] Borgherini: Ueber einen Fall von Muskelatrophie, Neurolog. Centralbl., 1890, p. 545.

[6] P. K. Pel: Berl. klin. Wochenschr., 1894, No. 5.

[7] Loc cit.

The question of cortico-trophic centres and their location. In all of the cases of cerebral amyotrophy reported the arm was implicated, in some instances singly (in six), in the remainder other muscles participated. In none was there an absence of the arm paralysis when it was present in other parts. The only exception was the case of Logan, which, however is not entirely unquestionable as to precise localizing value (traumatic injury). It would be premature to deduce from this fact the conclusion that somewhere near the arm-centre there is a trophic cortical centre, possibly for all the muscle groups of the opposite side. The only deduction permissible is that, as the arm is generally most affected in cases of cerebral paralysis, so muscular atrophy of cerebral origin is most pronounced in the arm, while the face and the leg may remain intact. The fact that there was absolute absence of degenerative changes of the cortico-muscular tract and the ganglion cells of the anterior horn would point to direct trophic fibres passing from some portion of the brain to the muscles. These centres, however, are, so far, only hypothetical. At all events, it is rather premature to conclude, as Luzzato (remark made by Steiner, *loc. cit.*) has done, that early atrophy in hemiplegias means involvement of the cortex.

There is at least one case in neurological literature which points to quite a different direction.[2]

This case would tend to prove, as the title indicates, that the gyrus fornicatus is not only the centre of sensation in accordance with the experiments of Horsley and Shaefer, but also of nutrition.

This observation, however, stands so isolated that it cannot count against the mass of evidence pointing to the Rolandic region as the probable seat of the musculo-trophic centres. Still, this is as yet an obscure subject.

Amyotrophy without the customary spinal lesions. What is particularly remarkable is the fact that there was no trace of a descending degeneration of the pyramidal tracts, nor were the ganglionic cells of the anterior horn altered to any considerable extent, contrary to Charcot's teaching, who holds disease or atrophy of these cells responsible for muscular atrophy occurring in cerebral paresis. Similar cases have been observed by Quincke,[1] who established the absence of descending degeneration in the corresponding pyramidal tracts and the integrity of the large ganglionic cells of the anterior in two cases. . Our case furnishes an analogy to those of Quincke. One cannot help thinking of a "dynamic" influence of the cortical cells, however distasteful such a qualification may appear to the naturalist and anatomist.

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[1] Fracture of the Skull with Localized Paralysis. Lancet, September 29, 1883.

[2] Saville: On a Case of Anæsthesia and Trophic Changes Consequent on a Lesion Limited to the Gyrus Fornicatus and Part of the Marginal Convolution. Brain, Summer and Autumn, 1891.

Comparative frequency of infantile and adult cerebral amyotrophy. It is a notable fact that cerebral amyotrophies in children are very frequent, as compared with the number met with in adults. Steiner[2] suggests that in children there is a certain dependence of the ganglion cells of the anterior horns on the ganglion cells of the brain; hence, cerebral atrophies are not rare. In adults the spinal ganglion cells are more independent, hence the rarity of muscular atrophies in the cerebral palsies of adults. If they do occur, they find their analogy, according to Steiner, in the infantile type. This, of course, is not an explanation, but a suggestion; besides, the correctness of the statement may be questioned. For, functionally, at any rate, the spinal cord is the more independent of the brain the younger the animal, and *vice versa.* For what is true phylogenetically, that the lower the order of the vertebrates the closer the approach to the spinal-cord animal, down to the lancet fish, which has almost no brain, is also true ontogenetically. The closer the approach to adult life of a vertebrate, the greater the subordination of the cord to the brain.

Post operative sensory disturbances. In this case, as in several others of the same type I had an opportunity of observing, impairment of sensation set in immediately after the operation, whilst no disturbance of this kind could be made out before. Here was a tumor of considerable size pressing on the whole of the middle third of the Rolandic area, producing complete paralysis of the corresponding arm and shoulder, and yet there was not the slightest trace of deficient sensation. But immediately following the operation there was marked anæsthesia. Such observations are in the highest degree perplexing, proving and disproving in the same individual the sensory qualities of the Rolandic region.[3]

Electrical reaction of the nerves and muscles. It is a well-known fact that in cerebral paralysis electric irritability of the affected muscles is not essentially altered from the normal types; that, if any change exists at all, it occurs in cases of very long standing, and consists in a simple lowering of muscular or neuro-muscular irritability corresponding to the intensity of the atrophy. In this case, electric exploration of the nerves and muscles of the affected side yielded in brief the following results: There was a slight lowering of the electric irritability, both faradic and galvanic. Galvanic reaction of the right ulnar nerve was changed, A C C > C C C. Of course, this is simply a reversion of the type, and degenerative reaction could not be diagnosticated on this finding, the characteristic sign of this being the slow, lazy contraction. This I could not establish in any of the muscles.

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[1] Ueber Muskelatrophie nei Gehirnerkrankungen. Deutsches Arch. f. klin. Med., 1888, Bd. xlii., quoted by Eisenlohr. Muskelatrophie und electrische Erregbarkeitsveräuderungen bei Hirnherden. Neurol. Centralbl., 1890, p. 1.

[2] Loc. cit.

[3] Cf. Bremer and Carson: A Case of Brain Tumor, etc. THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, September, 1890, vol. c. p. 240.

Only in a few cases of cerebral muscular atrophy have the muscles and nerves been electrically tested. So far such tests are chiefly of theoretic value. They are the more so ever since the electro-diagnostic differentiation between central and peripheral paralysis has been demonstrated to stand on a weak foundation. The establishment of degenerative reaction, even in hysterical muscular atrophy has almost dealt the death-blow to the formerly highly-prized diagnostic value of the reaction of degeneration.

Causation. Whether there was any causal relation between the fall on the head and the development of the tumor later on, can be only a matter of surmise. But the often-repeated observation, that brain tumors, principally gliomatous, but not infrequently also sarcomatous, have followed direct and indirect injuries of the head, point to the accident as a probable causative element.

REMARKS. The development and progress of the endotheliomatous process in the brain after the operation must have been a very rapid one. As remarked before, the brain-substance pressed upon by the tumor seemed intact at the time of the operation. Manipulation incident to the removal gave, no doubt, the impetus to the more rapid spreading of the morbid growth in the meninges and to the invasion of the brain-substance proper, which before the operation must have been free from tumor invasion. That in this case a good chance of complete success was missed, there can be no manner of doubt. If, instead of frittering away valuable time with the superfluous galvanic and worse than useless faradic current, and the bromide treatment—if, instead of all this, the localizing value of the paresis of the shoulder had been properly appreciated, the tumor might have been removed at a time when its dimensions admitted of a liberal excision of healthy dura mater around it, and when the compression of the brain-substance was not too far advanced to preclude the possibility of a *restitutio ad integrum.* As it was, the filling of the cavity left by the removal of the tumor was probably, in spite of the tampon, so rapid that numerous capillary hemorrhages must have taken place in and around the compressed area of the brain. The softening of nerve tissue was in part due to these hemorrhages.

The scientific importance of our case is somewhat impaired by the patient surviving the operation for over two weeks. During that time inflammatory changes and invasion of the malignant growth into the brain very much obscured and complicated the anatomo-pathologic conditions giving rise to the symptoms during life. It would, above all, have been of importance to ascertain to what degree and in what manner the cortex was changed. The topography of these changes might possibly have thrown more light on the question of a trophic cerebral centre.

INFECTIOUS ENDOCARDITIS, WITH SEPTICÆMIA, COMPLICATED WITH MULTIPLE NEURITIS.

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THE recognition of various septic or infective agents as causes of multiple neuritis is, of course, not entirely new. The mind recurs at once to such familiar instances as diphtheritic paralysis and to the less frequent but well-known examples of neuritis which occur after typhoid fever, smallpox, and other infectious diseases. More recently still the rather rare peripheral palsies seen after childbirth have been, perhaps justly, attributed to sepsis rather than to pressure. But this term "sepsis" has still a very wide and indefinite application, and seems to be used to include a large number of disease-processes—probably dependent upon a variety of pathogenic organisms—which have not as yet been differentiated and labelled. The infection following childbirth is probably not always the same in all cases, nor, again, is it probably always the same as that following upon a poisoned wound or a suppurating ear. Whatever their source or their exact nature, it has long been recognized that some peculiarly active and malignant disease-agents fasten upon the endocardium and upon the lining membrane of the aorta, whence, as from a centre, they proceed to sow broadcast their baleful effects.

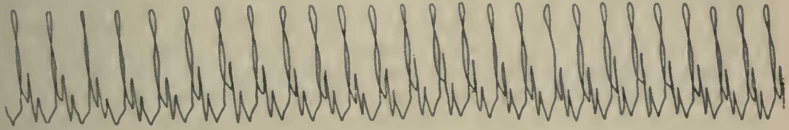
It is not, indeed, necessary to assume that these disease-agents are always the same. We know, on the contrary, that specific and distinct infective agents attack the endocardium with varying degrees of activity, as, for instance, those of rheumatism, of chorea, and of scarlet fever. But these diseases have other and distinctive clinical features which serve to mark them. There are, however, some, perhaps not a few, active and as yet unnamed, but very malignant forms of infection, making their habitat especially in the heart and great bloodvessels, which, because of their wide systemic effects, and because of their occasional disastrous consequences upon the nervous system, merit our special attention here. The commonly-described and rapidly-fatal ulcerative endocarditis is not the only form whose infection is to be feared, because there may be a non-ulcerative vegetative form, somewhat slower in its action, but none the less eventually fatal. This is marked by immense masses of vegetations, by heart symptoms sometimes obscure but sometimes conspicuous, by a true hectic or typhoid type of fever, by sweating and emaciation, and by various involvements of the nervous system, among the least common but most interesting of which may be neuritis. Multiple abscesses of the brain may also be observed. As an example of each of these we have a case to report here and specimens to present.

E. O., a middle-aged male; had been a steady drinker for years. He denied syphilis. He had been much exposed to hard out-door work, and during the past severe winter had earned a living by shovelling snow. In January, while thus employed, he was taken rather suddenly ill. He had fever and severe pains in his neck, back, shoulders, and limbs. He did not keep constantly in bed at first, but he continued to grow feebler, until one night he fell because of his weakness, and thereafter was obliged to remain in bed. He continued with fever and rapid emaciation for almost three months, losing over forty pounds during this period before his admission to the hospital. From the statements of the patient and his friends, and from his appearance when admitted, it seems probable that during this period of three months he had had a persistent hectic fever, with progressive emaciation and paralysis.

On admission to the hospital, early in April, the patient presented a rather anomalous appearance. He had two sets of symptoms which were prominent and clearly demarcated from each other. The first of these was a low typhoid type of fever, with rapid pulse and malnutrition; the second was an irregularly-distributed multiple neuritis. He was a dark-complexioned, much emaciated man, with a skin of peculiar swarthy or dirty yellowish-brown hue. The face had an expression of hebetude. The tongue was dry and coated, and had a bright red tip. The man's appearance suggested long neglect.

The typhoid type of symptoms was marked by a continued febrile course of temperature. On his admission the temperature was 101⅖°, and during his entire sojourn in the hospital, *i. e.*, for five weeks, the bodily heat was above normal. If to this period are added the three months before admission, during which he had evidently had the same wasting fever, we have a febrile course of more than four months. At first rather hectic, it became much less remittent toward the end. The pulse was weak and rapid, as high sometimes as 120, but occasionally falling to almost normal. This pulse and the heart-symptoms at once attracted attention, and eventually led to the correct diagnosis. The heart, for instance, had a booming first sound, with marked accentuation of the second pulmonic sound. A loud aortic diastolic murmur was heard, best in the third interspace at the *left* of the sternum. The apex beat was diffuse, heaving, and displaced downward to the left. The pulse was of the so-called "water-hammer" or "Corrigan" type; and this persisted almost until the end. It was unique. The artery bounded against the finger with much force; the blood, as it were, pausing for an instant as if in an eddy, then suddenly sinking away from under the touch. The accompanying sphygmogram shows this quickness of the pulse, the tracing of the downstroke coinciding almost with that of the upstroke. The loop is caused by the violent oscillations of the artery. The secondary waves are well marked (Fig. 1). Tracings could also be made from the ulnar artery, the pulsation of which was almost as strong as that of the radial artery.

FIG. 1.



The patient, as said before, resembled superficially one suffering from typhoid fever. He had the mental dulness, the wandering delirium, the dry-coated tongue, the rapid pulse, the continued fever, and the general asthenia and wasting. On the other hand, he had a good appetite, no bronchitis, no eruption, no typhoid stools, and the belly was scaphoid. Nor did the range of temperature, although constantly high, correspond strictly to that of the temperature of typhoid fever; there was not the regularity of evening rise and morning decline. Hence, the diagnosis of enteric fever was rejected.

But, as already said, the patient had a second group of symptoms quite as striking as those that characterized his typhoid state. He had very plainly the symptoms of a multiple neuritis. This was irregularly distributed.

The motor phenomena consisted in complete paralysis of the left arm, partial paralysis of the right arm, and double wrist-drop, more pronounced on the left side. The right hand had a tendency to assume the position of *main-en-griffe.* The legs could be moved, but power and nutrition in them were impaired. The knee-jerks were absent. There was no foot-drop. To the faradic current there was diminution in response in the left arm; no response at all in the extensors of the forearm, except in the extensor carpi ulnaris. The muscles of the right arm responded more actively than did those of the left. In the legs the response to faradism was sluggish; in the thighs it was good.

(The galvanic tests were not made, because of some defect in the battery. Later, when the battery had been repaired, the patient was so weak that it was thought best not to transport him to the battery-room, especially as the faradic tests had been quite conclusive.)

The feet and legs were slightly œdematous; the left hand and forearm, also, were somewhat swollen.

Marked wasting of the muscles of the shoulder girdle and of the arms, forearms, and hands was present. This was more noticeable on the left side. There was not marked wasting of the muscles of the legs. No fibrillary twitching, nor any spastic or increased myotonic state of any of the muscles was observed.

Sensory symptoms were not conspicuous. There was no distinct anæsthesia, but merely some retardation of sensation. No thermo-anæsthesia.

After admission the condition of the patient presented no striking change, only a progressive decline. He continued to grow more paralyzed, and the muscles of the arms and hands wasted more and more. Withal he had no pain, but he had a peculiar rigidity of the neck, which made turning somewhat painful to him.

The diagnosis of the disease was not easy at first, because the grouping of the two sets of symptoms made the man's condition enigmatical. Typhoid fever, which the malady resembled most at first glance, was excluded, as already said, by the range of temperature, the absence of the rose colored spots, the scaphoid belly, and the absence of the characteristic stools. That there was some septic or infectious process seemed certain, because of the persistent hectic temperature, the sweating, the delirium, the involvement of the heart and pulse, and the albuminous urine. That the man had multiple neuritis was evident, and he had the history of exposure and alcoholism to explain it, in part at least; but the diagnosis of multiple neuritis of alcoholic origin could not be made conveniently to include his typhoid conditon, which had existed now for many weeks. In our experience simple alcoholic multiple neuritis is not accompanied with a hectic state of many weeks' duration. The suggestion of a septic or ulcerative, endocarditis occurred to our minds as the most plausible explanation of the symptoms; and this diagnosis was established eventually by the discovery of a persistent and gradually increasing regurgitant aortic murmur, with its accompanying "water-hammer" pulse. I say "established," because while this diagnosis is regarded usually as problematical to a certain extent, it was not so in our case. The lesion seemed to assert itself so very conspicuously under our observation as the case progressed that, with its attendant hectic phenomena, it left no reasonable doubt of its accuracy. The association of a multiple neuritis with this systemic infection was the phenomenon which to our eyes gave the case a unique and paramount importance, and to which reference will be made again. In the expectation of possible embolic processes in the spleen and kidneys, the splenic region was examined repeatedly for tenderness and the urine for blood corpuscles. Neither were observed, although the autopsy, as will be seen later, showed infarcts in the spleen and in one kidney.

About three weeks after admission our diagnosis of a septic endocarditis was much strengthened by the appearance of small purpuric spots scattered over the body. This eruption was characteristic of a process of blood-poisoning. The patient continued to have a rather high rise of temperature at irregular intervals, and had frequent profuse, drenching sweats. A few days later a bedsore developed over the sacrum. Sudamina also appeared.

The patient's strength gradually failed. Stupor, carphologia, feeble pulse, and high temperature marked the closing days. He died five weeks after admission to the hospital.

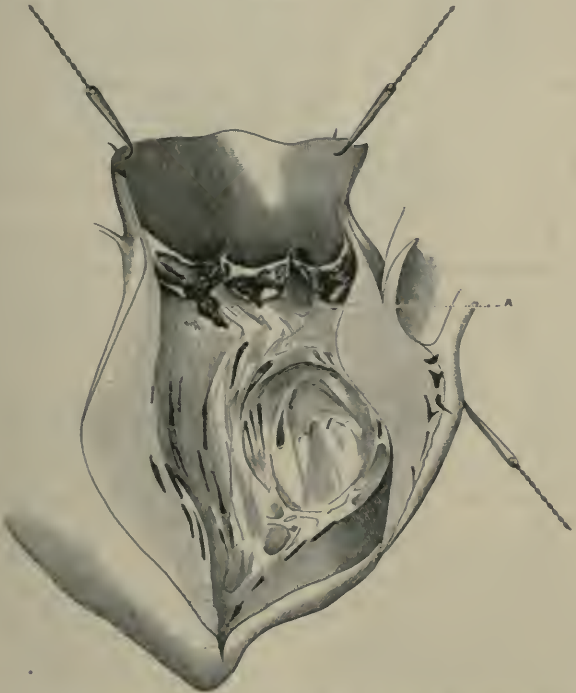
Notes of autopsy. Body of a much emaciated, middle-aged man. The muscles of the chest and arms are wasted. In each hand the atrophy of the abductor indicis is very marked. The fingers are flexed at the first interphalangeal joint. The scapular muscles, especially the supraspinatus and lower portion of the trapezius, are much wasted. The buttocks and hips are the seats of extensive decubitus.

Abdominal cavity. With exceptions to be noted, the contents are normal. No lesions of typhoid fever in the intestines.

Thoracic cavity. The pleuræ are bound together on each side by adhesions of moderate firmness. The lungs are rather œdematous, but otherwise normal. The pericardium contains an excess of fluid, there being about two and a half ounces of yellow, translucent serum. The parietal pericardium shows a milk spot.

Heart. Enlarged; left ventricle firm. Right ventricle contains a small quantity of fluid blood and a chicken-fat clot which has long ramifications through the auricle into the veins. The tricuspid orifice is large and easily admits four fingers and the thumb. Mitral orifice is normal in size, admitting two fingers. Left chambers almost empty. Left ventricle contracted. A small chicken-fat clot is in the left auricle and aorta; also in the pulmonary artery. The right ventricle seems to be dilated; the wall 6 mm. thick; the wall consists almost entirely of columnæ carneæ. The tricuspid valve is thickened along its edges. The pulmonary valves are normal, except for some thickening along the free

FIG. 2.



Interior of the heart, showing vegetations on the aortic semilunar valves.
A. Aneurismal cavity.

margins of one of the leaflets. Mitral valve is thickened, with a tendency to atheromatous change in the anterior leaflet. The chordæ tendineæ of the anterior leaflet are unusually thick. The heart-muscle is lighter in color than normal and diminished in firmness, evidently on account of degeneration. The papillary muscles especially are light in color.

The *aortic valves* present an astonishing condition. Springing from the inner surface of each leaflet there are huge, cauliflower-like vegetations, which are soft, compressible, slightly injected, the protuberances here and there spanned by threads of lymph. (Fig. 2.) The excrescences are longest and thickest on the anterior and middle leaflets. The posterior leaflet is covered by a large number of vegetations, but of small dimensions. The growths spring from the valve a little below the free margin. On the anterior leaflet the base of the growth extends clear across the valve; on the middle leaflet, two-thirds of the way across. On the posterior the base of the vegetation covers a little more than half of the leaflet. The length of the anterior growth is 2 cm., of the middle also 2 cm. The thickness is 6 mm. in the first and 3 mm. in the middle growth. Vegetations also spring from the angular space between the valves. At the junction of the anterior and posterior leaflets there is a deep cavity, which is surrounded by vegetations, has a roughened interior, and looks almost like a small aneurism. (Fig. 2, A.) The outer surfaces of the valves (facing the aorta) are ridged, and in the position of the vegetations show a funnel-shaped depression running into the vegetations. The intima of the aorta is intensely atheromatous, showing sclerotic and calcareous patches. Weight of heart 14 ounces.

The *spleen* is slightly enlarged. Patches of old perisplenitis are seen, and in the upper part there is a characteristic anæmic infarct. It is a large, white, wedge-shaped mass, extending from the cortex inward a distance of 2½ cm., and measuring 4½ cm. in width at its base. Weight of spleen 6½ ounces.

Suprarenals normal.

Kidneys. In the left kidney the renal arteries stand out prominently; the kidney is firm and normal in size; the capsule strips quite readily, leaving a smooth surface. Weight 5 ounces. In the right kidney the ureter is somewhat dilated; the kidney is normal in size; on its anterior surface are one large and one small yellow patch, which, on section, are seen to be the bases of wedge-shaped masses. In appearance these are white infarcts, like that in the spleen. The capsule strips readily. Weight 4½ ounces.

The *liver* weighs 57 ounces. On section it shows prominence of the interacinous connective tissue. The other abdominal organs are normal.

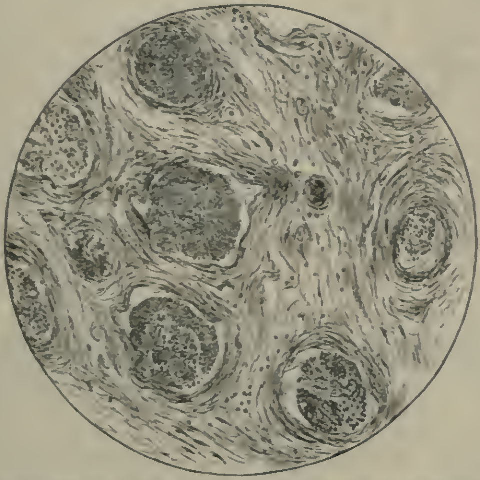
The *aorta* is very atheromatous, especially in the arch and thoracic portion, where there are numerous large calcareous plates.

Brain. The membranes are somewhat œdematous, the pia strips readily. The vessels of the circle of Willis are distinctly thickened; from the right middle cerebral artery, within the fissure of Sylvius, springs a small yellowish body a little larger than a grapeseed, quite firm; it is not a dilatation of the artery; it rests in the brain-substance like a foreign body; no area of inflammation or softening surrounds it; it may be a small infarct similar to that in the spleen. On removing the dura from the cord, thin whitish, scaly patches are seen on the pia about the middle of the cord; these scales are not calcareous, but of cartilaginous firmness. Weight of brain 45½ ounces. In the *cord* itself nothing pathological is discoverable with the naked eye.

Description of Sections.

Musculo-spiral nerve. Right. This nerve shows marked increase of the connective tissue between the fasciculi. (Fig. 3.) This increase is quite apparent even to the naked eye on holding the section up to the light. Hence this is not a pure parenchymatous neuritis. The individual fasciculi also show in some instances decrease in the number of nerve-fibres and increase in the connective tissue. Some fasciculi exhibit bundles of long, opaque fibres in places where the fasciculus has been cut in an oblique direction. In one place a much thickened bloodvessel is seen, and in several places obstructed vessels.

FIG. 3.



Section of the musculo-spiral nerve, showing proliferation of the connective tissue.

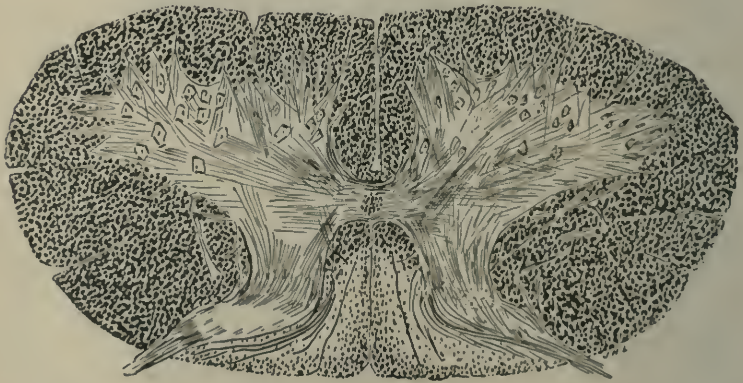
Left. About same appearances as in right.

Ulnar nerve. Right. A much thickened and obstructed bloodvessel is seen in one place near the periphery. There is also general increase of the connective tissue, but the individual fasciculi are in better state than in the musculo-spiral nerve. About some of the obstructed bloodvessels, and also about one of the fasciculi—here nearly empty—there is an accumulation of leucocytes. In some places in these sections proliferated connective tissue in concentric layers around bloodvessels is seen (as shown in Rosenheim's illustration as found in Dana's *Textbook*, p. 69). These are probably identical with the "islets of sclerosis" found by Gombault in his case of Landry's paralysis.

NOTE.—In all these sections the nerve fibres have stained heavily—Weigert's stain—and it is not easy to state exactly whether individual fibres are degenerated or not. The general appearance, however, of all these sections leads to the opinion that we have here a connective-tissue proliferation—*i. e.*, a true inflammation, which includes in some instances the fasciculi, but that the effects upon the fibres are chiefly secondary or degenerative. It is in accord with the ideas of modern pathology to expect to find the results of inflammatory processes in connective tissue and about bloodvessels, as we do in this case. The occurrence of a primary parenchymatous neuritis, as advocated by some, especially Gowers, if by this is meant a precedent and independent involvement of the axis-cylinder, is not so in accord with modern ideas; and this involvement must be an exceedingly difficult thing to demonstrate, even by the most expert pathologist. Certainly most of the illustrations given in the books do not convey such an idea.

Spinal cord. The interesting fact is noted that in the cord, otherwise healthy, there is some evidence of degeneration in the posterior columns. In the cervical region this is marked in both the columns of Goll and Burdach (Fig. 4). In the lumbar enlargement, however, the regions of the root-zones are most involved. This association of posterior sclerosis with multiple neuritis has been noted by others. The anterior horns in all the sections examined have a full supply of multipolar cells, and the lateral pyramidal tracts are in nowise affected.

FIG. 4.



Cervical enlargement of the spinal cord from a case of infectious endocarditis with multiple neuritis, showing degeneration at this level of both postero-median and postero-external columns, with preservation of small strip along postero-median septum.

It is well to remember, in examining these sections, that they have been made from the nerve-trunks at some distance from the periphery. As is well known, the most marked changes are usually in or near the peripheral nerve-endings. Hence, in this case the sections are from a portion of the nerves probably some distance above the areas of greatest change.

The association of a septic process and multiple neuritis was the phenomenon which gave our case an especial interest. The explanation of this association is, of course, the one point of scientific importance. Was the association a mere coincidence, or was the septic process the cause of the neuritis?

Several points must be considered in this connection. First, the septic process was probably antecedent to the neuritis, as shown by the history. The exhausting, wasting hectic fever had existed for many weeks before the patient's admission to the hospital. It was the most conspicuous of the two sets of symptoms, and the one that caused the fatal end. The patient died of sepsis, not of neuritis. The origin of this sepsis is, it is true, problematical. It was not in any way consequent upon a nerve-lesion, as is sometimes seen in cord-cases, in which a septic infection occurs from a bedsore. This patient had no bedsore nor any break in his skin when admitted to the hospital, far advanced in his disease, and no bedsore developed until toward the end. Again, it may be observed that this septic process did not depend upon a pus-forming bacillus. The vegetations within the heart and the infarcts in the spleen and the kidney were not attended with the formation of pus. An exception was possibly observed at the base of one of these masses, where what seemed to be a small ulcerated cavity was found. There were no multiple abscesses as in cases of pyæmia. In this respect this systemic poison resembles some of the other great nerve poisons, as, for instance, those of tetanus, hydrophobia, chorea, and diphtheria, in none of which is there a formation of pus. The origin of the infection in the heart in our case is obscure.

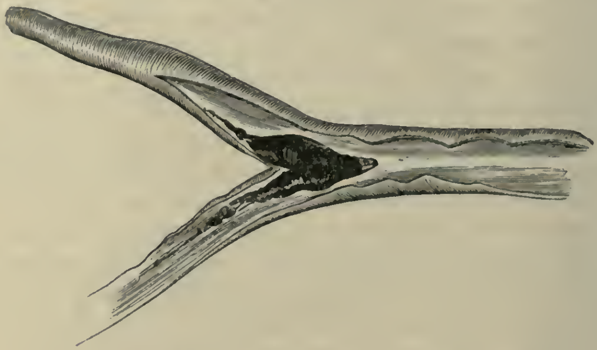
Finally, the neuritis was not so extensive and severe as occurs in some cases that recover. It was only irregularly distributed, and not, as in most fatal cases of neuritis due to alcohol, symmetrically and extensively spread. In fact, it does not seem probable that the neuritis, severe as it was, would have killed the patient without the septic process. On the other hand, there is evidence, no doubt, in favor of an alcoholic origin of the neuritis. The patient had been a steady drinker for years, and this excess was associated with hard labor and exposure—an association which, more than any other, precedes the onset of this disease.

A bacteriological examination of these cardiac vegetations would have been a most desirable conclusion to our study of this case, but was not possible at the time.

In conclusion, we would call attention to the extreme importance of these immense giant vegetations in the heart, and occasionally in the aorta, as causes of obscure but grave symptoms, both general and nervous. Only a few days ago, and since this report was made up, a man died in the hospital service of one of us with symptoms simulating closely those of typhoid fever. His case was briefly as follows:

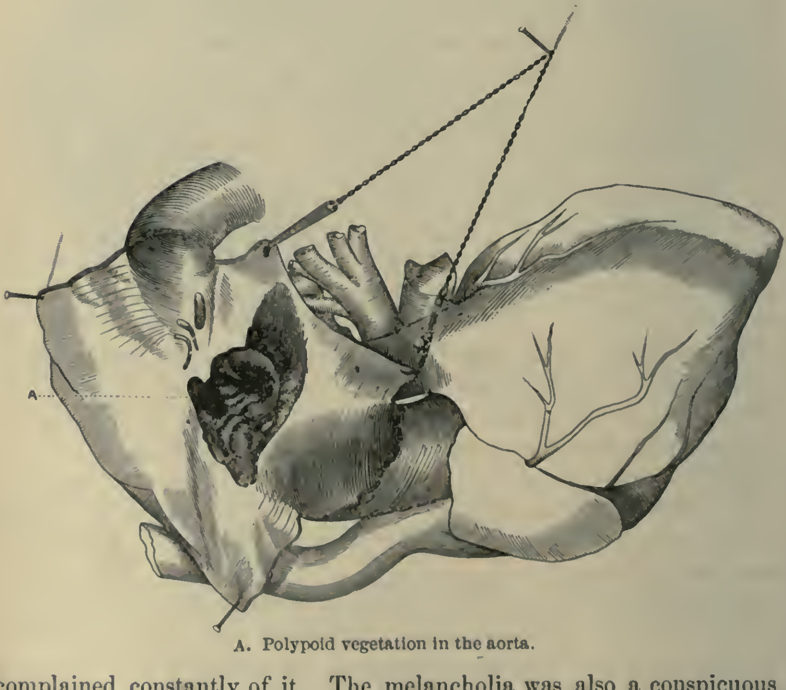
A. B., male, aged about forty-five years, was admitted to the hospital suffering with headache, hebetude, psychic disturbance, such as melancholia, and an almost persistent but variable fever. The headache was frontal, and apparently severe, for the patient, even in his hebetude,

FIG. 5.



Brachial, radial, and ulnar arteries, with embolus at bifurcation

FIG. 6.



A. Polypoid vegetation in the aorta.

complained constantly of it. The melancholia was also a conspicuous symptom; it was associated with delusions of personal unworthiness. When roused and questioned he reverted constantly to the subjects of his melancholic delirium, and sometimes he wept about them. There had been, also, some diarrhœa and abdominal distention, so that the case simulated rather closely typhoid fever. No rose-colored spots, however, could be found at any time, and the temperature, instead of ranging constantly above normal, dropped occasionally to 98° or below that point, as it is apt to do in septic cases. The diagnosis of the case remained quite obscure. There were no lung-symptoms, and nothing wrong was found in the urine except some albumin. There was a history of exposure to the sun, which suggested at first heat-stroke. Later, tuberculosis was suggested, searched for and excluded. No cardiac symptoms were present, as the mass found post mortem in the aorta did not embarrass the heart's action in the least. Absence of the left radial pulse, however, was noted for more than a week before death, and this was observed to be due to an obstruction which could be traced to the bifurcation of the brachial artery. The brachial artery itself pulsated. Sepsis, due to some pus-forming organism, seemed to be a plausible explanation of all the symptoms, but its mode of entrance into the system and its chief habitat remained a mystery to the end.

Post mortem the patient was shown to have had small multiple abscesses in the brain, a large embolus in the left brachial artery (Fig. 5) which had been recognized in life, and a large recent infarct in one kidney—all caused evidently by an immense vegetating mass which was found on the inner wall of the aorta at its arch. A drawing of this vegetating mass is given here. (Fig. 6.) It may be observed from this drawing that this mass is almost directly in front of the orifices of the great arteries of the head and arms—*i. e.*, the innominate, the carotid, and the subclavian. From it, as from a centre, small emboli had been carried to the brain, where they became each the focus of a small abscess, and to other organs and parts, especially into the brachial artery and to the kidney.

EXTERNAL PILES AND THEIR RELATION TO THE EXTERNAL HEMORRHOIDAL VEINS.

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The swellings and vascular tumors occurring at the lower extremity of the alimentary canal, known as hemorrhoids or piles, are very naturally classified, according to their position, as either external or internal. This classification is based not only on the fact that one group is in view and covered with skin, while the other is concealed within the bowel and covered with mucous membrane, but also on account of their relations to the external and internal hemorrhoidal veins respectively.

As the essential element in a large majority of hemorrhoidal swellings is a varicose condition of the hemorrhoidal veins, the study of this disease cannot lead to any satisfactory results unless based upon a comprehensive and accurate knowledge of the arrangement of these veins. The hemorrhoidal veins comprise the internal or superior hemorrhoidal, the middle hemorrhoidal, and the external hemorrhoidal, all of which accompany the arteries bearing the same names.

The *internal* or *superior hemorrhoidal veins*, an important factor when in a diseased condition in the production of internal piles, form a complex interlacement in the submucosa of the lower rectum, known as the hemorrhoidal plexus. These veins are valveless and collect the venous blood from the mucous membrane of the rectum, conducting it through openings in the *muscularis* into the inferior mesenteric vein, thus forming the most dependent portion of the portal system.

The point in the anal canal that marks the transition from skin to mucous membrane also marks the lowest and most distant region in the body tributary to the *vena portæ.* This transition takes place quite abruptly, a little above the lower border of the internal sphincter. In the living body its approximate location its determined by the presence of a more or less distinct sulcus or groove completely encircling the anal outlet in a somewhat zigzag course (see Plate, Fig. 1, *g*). This groove also marks a point from which the venous blood flows in two different directions; a watershed, so to speak, of the portal veins on the one side, the iliac veins on the other, but a watershed of such low altitude that under certain conditions it does not interpose a sufficient barrier to prevent an intermingling of the two streams. At this point, as will be seen by the accompanying drawing made from one of my dissections, the external and internal hemorrhoidal veins are continuous one with the other, the communication being established by numerous short and narrow anastomoses in the submuco-cutaneous tissue underlying this groove a little above the lower border of the internal sphincter.

DESCRIPTION OF PLATE.

FIG. 1.—An alcoholic preparation of the lower rectum opened lengthwise in the median line anteriorly, a portion of the mucous membrane and muco-cutaneous tissue having been removed to expose the internal and external hemorrhoidal veins.

X, X′. The lowermost *plica transversalis recti*, one of a series of ineffaceable transverse folds that are present in the rectum, with considerable variation as to their number and distinctness in different individuals. These folds are arranged, one beyond the other alternately on the left and right sides of the rectum, and are analogous to the transverse folds that characterize the colon, showing, as I have elsewhere demonstrated (Leipsic, 1887), that the rectum, like the colon, is sacculated. *a*. The short and narrow anastomoses between the dilated portion of the internal hemorrhoidal veins above and the dilated portion of the external hemorrhoidal veins below. *e*. Dilated external hemorrhoidal veins. *g*. The sulcus or groove that encircles the anal orifice. Just above are to be seen the *columnæ* and *lacunæ* of Morgagni. *i s*. Internal sphincter. *e s*. External sphincter.

FIG. 2.—A semi-diagrammatic drawing of a longitudinal section through the side of the lower end of the rectum.

1. Skin. 2. External sphincter. 3. Levator ani. 4. Longitudinal muscular fibres. 5. Circular muscular fibres terminating in the internal sphincter. 6. Internal hemorrhoidal veins in the submucosa. 7. Mucous membrane. 8. One or more papillæ are often seen on the bases of the columns; this is due to the fact that the papillary layer of the external skin extends for a short distance above the groove onto the columns, while in the lacunæ between the columns the follicles of the mucous membrane are present as low down as the groove. 9. The *ano-rectal* groove which is produced by the distention of the internal veins just above it and the external veins just below it. In the dead body, where the veins are empty, the groove will not be apparent. 10. Dilated portion of an external hemorrhoidal vein.

Fig. 1.

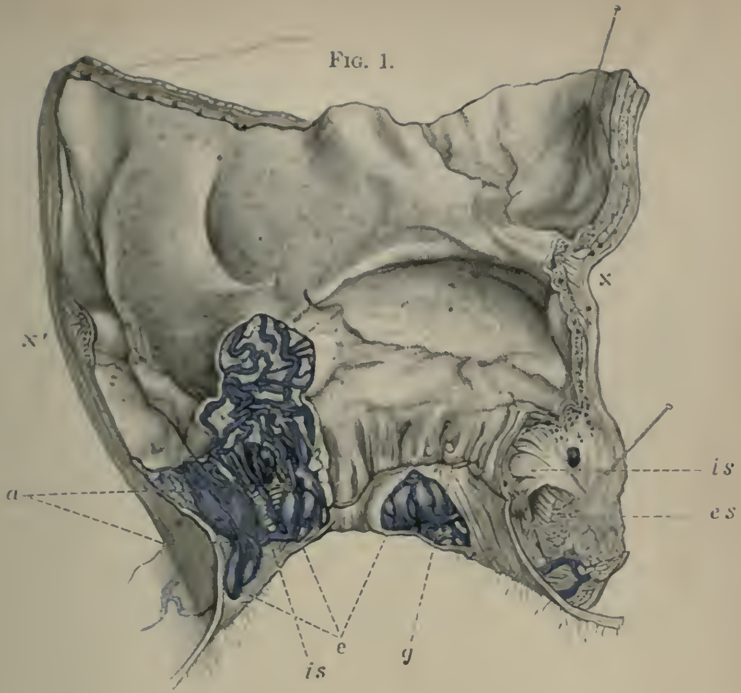
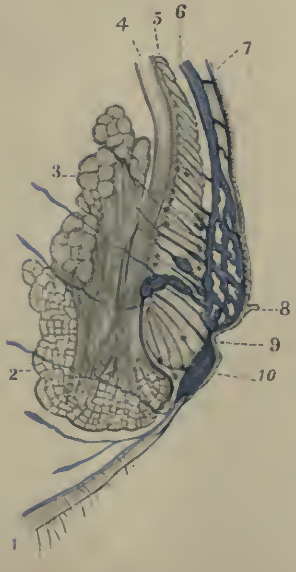


Fig. 2.



From these short and narrow anastomosing branches the external and internal hemorrhoidal veins may be said to begin; the internal veins ascending in the submucosa of the rectum, the external veins descending and radiating away from the rectum, under the skin. The internal veins, as they ascend from this point of origin, immediately break up into a meshwork[1] of short and irregularly-dilated branches for the most part fusiform and bulbous[2] in shape, completely encircling the canal and confined to that portion of the submucosa included within the grasp of the internal sphincter. On examining this part of the venous apparatus more closely, these dilatations or ampulla-like sacculations are seen to be arranged in clusters[3] in a circular manner, situated in the bases of the longitudinal folds of the mucous membrane of the rectum, known as the *columnæ recti.* These clusters of sacculations spread out laterally as well as centrally, and communicate one with the other, while the axes of their component parts are vertical. They do not hang from their efferent veins like grapes from their stems, for they are possessed of afferent veins as well, and appear to be nothing more or less than varicosities that have undergone a certain amount of proliferation. As the upper border of the internal sphincter is approached they converge and reunite, forming large trunks which pass up the bowel alongside of the terminal branches of the superior hemorrhoidal arteries. In the meantime, numerous fine branches have been given off from the sacculations to traverse the fibres of the sphincters[4] and to find their way, by a more circuitous route, into the iliac veins.

The *external hemorrhoidal veins* do not present such a complicated arrangement of sacculations as is seen in the internal veins just described; but they, in turn, as they emerge from the lower border of the internal sphincter, are very much dilated, so that the lower border of the internal sphincter and the internal border of the external sphincter are completely hidden by the pouch-like dilatations of these veins. From here the veins abruptly narrow down, and form an interlacing network of fine subcutaneous branches, inosculating to form larger branches, finally emptying into the internal pudic veins. Thus it will be seen that it is possible to inject from the inferior mesenteric vein all the hemorrhoidal veins,[5] both within and without the lower rectum, with the exception of the middle hemorrhoidal veins, an exception accounted for by the fact that these veins are by no means constant,[6] and that when they are present[7] they do not start from the mucous membrane of the rectum and consequently are not a factor in the production of hemorrhoids.

Looking at these veins collectively, two points are to be noted: First. The lower end of the rectum is surrounded by two rings, or zones, of dilated plexiform veins, forming an internal and an external hemorrhoidal plexus, the one situated just within the bowel, and corresponding in area with the internal surface of the internal sphincter, the seat of internal hemorrhoids; the other zone situated just without the bowel, and corresponding in area with the internal border of the external sphincter, the seat of external hemorrhoids. Secondly, that the two plexuses communicate, the anastomosis taking place in the submucosa underlying an *ano-rectal groove.* Whether this arrangement of the rectal veins exists in the early stage of life I cannot say; but that it occurs normally in the adult seems to me very probable, intensified and aggravated, no doubt, by the erect position of the body, the dependent position of the veins, and the act of defecation.

I have selected as the topic for this paper external piles, particularly on account of the intimate relations borne by some of these swellings to the external hemorrhoidal veins; some, on the other hand, having no connection whatsoever; hence, the reason I use the general term piles in preference to hemorrhoids, as, bleeding not being a symptom of external piles, external cutaneous piles certainly cannot, strictly speaking, be called hemorrhoids. With a view to ascertain the relative frequency of internal and external piles, I have gone over the cases of rectal disease that have applied to me for treatment during the past few years at the Boston Dispensary. Out of the total number of 1472 cases, 895 have come under my personal observation. Of these 895 cases 338 were cases of piles, 171 internal, 167 external piles. These data are not sufficiently exhaustive to warrant the inference that internal piles are of more frequent occurrence than external, though I believe this to be the case, for it must be remembered that external piles in the acute stage are very distressing, with no cessation during the attack, compelling the sufferer to seek medical aid; while, on the other hand, many persons who are subject "off and on" to internal piles are only conscious of the disease during a period of constipation, and then only at the time of defecation, with comparative comfort during the intervals. Such cases are not compelled, as in the first instance, to seek medical advice, and either do nothing or rely upon favorite remedies recommended by friends or the nearest druggist.

As the tissue involved in the production of external piles is either vein or skin, they can be divided into two principal varieties, venous and cutaneous.

The venous variety of external pile occurs in two forms:

1. As a varicose condition of the external hemorrhoidal plexus.
2. As a thrombosis of the external hemorrhoidal plexus.

1. A *varicose condition* of the external hemorrhoidal plexus,[8] I have already pointed out, is probably the normal arrangement in every adult. A familiar instance of this is seen in every operating-room with a patient in the lithotomy position when pressure is brought to bear on the abdominal contents, as by the straining of vomiting. It is also made evident by the act of defecation when the internal sphincter

dilates to let the contents of the rectum pass out. The extent to which this venous dilatation is carried will vary with the habits of the individual as regards constipation and the amount of straining and bearing-down at stool. This form of the disease is most marked in those persons who are subject to internal piles; in fact, in these cases it is a symptom of internal piles. Inasmuch as the blood by which this plexus of veins is dilated comes from within the bowel, that is, a backward flow from the portal veins, the condition of the internal sphincter is also going to affect the amount of varicosity present in these veins: the stronger and tighter the muscle contracts the less the amount of regurgitation; the weaker and looser the contraction the greater the amount of blood that will be forced by.

To make my meaning clearer I must refer briefly to the anatomy of the internal sphincter (see Plate, Fig. 2). This muscle is a thickening of the lowermost fibres of the circular muscular coat of the rectum, encircling like a wide and thick band the extreme end of the alimentary canal for a distance of about 1¼ inches. Its fibres being non-striated, it is an involuntary muscle, and, except during the exit of gas and feces, it is always in a state of firm tonic contraction. The puckering of the mucocutaneous integument into folds, which are seen radiating from the anus, is due to the tight contraction of this muscle; hence, it is evident that its lower ring-like border must be subcutaneous, a point in the anatomy of this muscle not generally appreciated. The external sphincter is placed just outside of the internal sphincter, which it surrounds and partially overlaps, its lower border reaching from one-half to three-quarters of an inch below that of the internal sphincter. Consequently the internal sphincter is internal to the external in two senses—in one sense that it is surrounded by it, in the other sense that it is placed a little further within the body. The external sphincter is a voluntary muscle, and when at rest exerts no active influence in closing the anus, that office being performed by the internal sphincter; but when gas or feces are propelled by peristalsis against the upper border of the internal sphincter, then the sensation of an impending evacuation is produced, the internal sphincter dilates and offers no resistance, and a threatened disaster can only be prevented by voluntary contraction of the external sphincter, together with the other perineal muscles. The firm tonic contraction of the internal sphincter above alluded to, a condition which obtains for the entire twenty-four hours, with the trifling exception of the time consumed in passing the contents of the bowel, presents an obstacle to the regurgitation of portal blood essential to dilatation of the external hemorrhoidal plexus. We must assume either the presence of hepatic obstruction or intra-abdominal pressure of whatever kind, or the existence of a constipated habit with prolonged straining at stool, as the force at work to produce a varicose condition of these veins. Without ignoring the significance of the more remote causes I am inclined to believe that the act of defecation is the most important factor in the production of this condition.[9] As long as the veins remain pervious and free from inflammation there will be no very marked symptoms, and the patient will, in all probability, be unaware of the existence of the disease; but when any portion of these varicose veins becomes the seat of thrombosis and phlebitis, a not infrequent occurrence, then will be produced the second variety of the external venous pile, known as the thrombotic pile.

2. The *thrombotic pile*[10] is of very common occurrence. In fact, it is met with much more frequently than any of the other forms of external pile. Of the 167 cases of external piles mentioned above, 107 were of this nature. It has been my experience to find it much oftener in the male than the female. It is liable to happen to any one, regardless of his condition, circumstances, or habits. Among the class of patients that frequent the Boston Dispensary it is not uncommon to find that the disease appeared during a protracted debauch, and also to find it associated with constipation or a particularly hard and difficult stool; while, on the other hand, it happens as well to the temperate and those with strictly regular habits. The disease makes its appearance quite suddenly, sometimes with a premonition of from a few to twenty-four hours of local soreness and slight swelling before the tumor is fully formed. From the suddenness of its appearance the patient often imagines that it is a prolapsed internal pile, and needless suffering is caused by fruitless attempts to push it back. The site of the pile is identical with that of the varicose pile just described, that is, in any portion of the zone of dilated veins forming the external hemorrhoidal plexus. Such a tumor would be located just below the lower border of the internal sphincter, opposite to and within the grasp of the external sphincter. The size depends entirely upon the size and number of the thrombosed veins, while its shape is flat, with a broad base resembling somewhat in appearance a large bleb of dark color. The color of the pile is quite characteristic, livid, with dark-blue spots here and there, this color not belonging to the tissue, but transmitted through it from the thrombus or thrombi within.

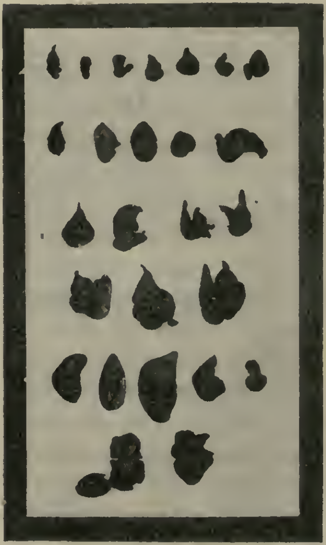
When thrombosis occurs in this locality the process appears to be limited to the dilated portions of these veins without complete stasis affecting a large territory, and the resulting reaction is confined to the walls of the vessels immediately affected whose vessels of supply are obstructed, giving rise to slight inflammatory swelling with moderate redness, considerable pain, and a watery infiltration of the cellular tissue.[11] In some cases of thrombotic pile the amount of œdematous swelling is so marked as to be misleading and obscure the actual condition present, but by keeping up a firm and continuous pressure with the fingers it will be possible to make out the presence of one or more hard and very sensitive nodules indicating the location of the thrombi. If the thrombotic pile is let alone, it will, as a rule, entirely disappear without leaving any external evidence of its existence. However, if from the amount of pain present, and from the inconvenience of the swelling, incision be deemed advisable, immediate relief will be given; but by the addition of the element of trauma a small but permanent cutaneous pile is likely to remain after complete convalescence. In all such cases it is my practice to advise immediate incision to let out the clot and relieve the tension, to accomplish which purpose I use an ordinary but sharp scalpel, first washing the surface of the pile with a 5 per cent. solution of carbolic acid; selecting as the point of incision a dark-blue spot or a point directly over the largest nodule (for it is rare not to find more than one), a quick and deep incision is made directly into the thrombosed vein. Oftentimes the thrombus will shell out like a bean from its pod, but more often the thrombus will only protrude from the opening, being held back either by an adhesion to the wall of the vein or by an extension into a communicating branch, requiring a little force to relieve it. On looking into the wound thus made more thrombosed veins will be seen, which can be opened as well from the cut already made as from a second incision; but a second and even a third incision is sometimes necessary, especially in case the pile occupies the entire side of the anus. After the removal of the thrombi, the swelling being perceptibly reduced in size, the pile is washed with a 1:3000 bichloride solution and the wound dusted with a powder of equal parts of iodoform and boric acid; to prevent bleeding and further swelling firm pressure is applied by means of a graduated compress and maintained with a T-bandage tightly drawn for the next twenty-four hours, or longer if possible. I have seen on a few occasions a thrombotic pile from which there was a constant oozing of blood. This invariably occurred in a pile that had been present for two or more weeks, the bleeding causing the patient to seek medical aid. The appearance presented was that of a moderate-sized pile with a sloughing of the integument directly over the thrombus, and through the breach thus formed was protruding the thrombus partially organized. How the coagulum in these cases got out of the vein I am unable to say, but as there was always more or less suppuration present, it is possible that that process had something to do with it. This is one of the very rare instances in which bleeding occurs as a symptom of external piles.

Examination of the thrombi, after their removal, reveals a decided similarity in shape, the majority conforming to one type, conical, tapering to a fine thread-like point, the color of the thrombus in its thickest portion being a deep blood-red; at the edges and the tapering point it is a translucent pink.

In the light of the anatomical arrangement of the veins where these thrombi are formed, it is impossible to come to any other conclusion than that the coagula are casts of these veins.

With a view to determining whether, as Ball states, these thrombi are formed within and not without the veins, for sometime past I have been in the habit of saving all thrombi and preserving them in alcohol for the purpose of studying and comparing their shapes. The result has fully established the accuracy of the views of this writer.

FIG. 3.



Showing the general shape and form of thrombi that have been removed from thrombotic piles during life.

The accompanying cut represents some of these clots arranged for exhibition on a piece of glass. The general shape to which they all conform is conical, with a rounded base; some are casts of a single dilated vein, while others are evidently casts of two or more communicating branches. Many writers deem this form of venous pile an encysted blood clot occurring outside the vein, brought about by extravasation of blood from a rupture of one of the external hemorrhoidal veins during defecation. That this view of the disease is an erroneous one is proven, I think: (1) by the absence of any staining of the tissues which characterizes extravasation; (2) by the fact that when the pile is incised the thrombosed veins can be seen side by side in the infiltrated cellular tissue, incision into the vein demonstrating the presence of the thrombus; (3) by the fact that the thrombi are casts of the veins in which they are formed.

In the second variety of external pile (*the cutaneous*) the external hemorrhoidal veins do not play so important a rôle as in the venous pile just described. Cutaneous piles are essentially swellings or hypertrophies of the muco-cutaneous integument, and with one exception are brought about by, or are secondary to, some inflammatory process just within or near the anus. As it is possible to recognize three different forms of cutaneous pile, I would suggest for their more ready comprehension the following classification:

1. The redundant pile.
2. The hyperplastic pile.
3. The hypertrophic pile.

1. The *redundant pile* is that condition of the anal muco-cutaneous tissue often met with and variously described as a simple redundancy, or again as a superabundance of skin. It is in reality a compensatory increase in the amount of the circumanal integument, brought about not by any inflammatory process but by stretching—a stretching of the skin resulting from excessive distention of the subjacent veins in those individuals in whom the act of defecation is accompanied with excessive and prolonged expulsive efforts. The stretched skin hangs in loose folds like a fringe, either entirely surrounding the anal outlet or confined to one side, or occurring only at one or more isolated points, and wherever found is a sure indication of the existence of a varix directly underlying it. The redundant pile is soft to the touch, and the two surfaces of the reduplicated skin are freely movable upon each other. In marked contrast to this appearance of the pile is that observed during defecation. Then the slack is all taken up and the skin put upon the stretch by the swelling and distention of the subjacent veins. Like the varicose pile, it is always associated with and secondary to internal piles, and when occurring in its fullest degree may be taken as an indication of the existence of internal piles of long standing with a weakened internal sphincter. This weakness or looseness of the internal sphincter is caused by the stretching it receives from the frequent prolapse of the internal hemorrhoidal tumors. Another phase of the redundant pile is seen whenever internal piles have become prolapsed and strangulated. Then the resulting venous hyperæmia and the obstructed lymph channels give rise to an œdematous swelling of the loose muco-cutaneous tissue just outside of the prolapsed internal pile or piles. If the prolapsed rectal tissue comprise only a portion of the internal pile area, then the external swelling will be confined to the adjacent integument; but if it involve the entire circumference of the internal "pile-bearing area," then it will surround it as a ring, each form of pile having its own peculiar color, the two being separated by a deep sulcus,[12] the same sulcus or groove already described as separating the internal and external hemorrhoidal venous plexuses.

In cases of *prolapsus recti* not associated with internal piles, if the middle or upper portion of the rectum be the part extruded, the condition is that of an invagination, and for obvious reasons the ring-shaped œdematous redundant pile will not be present. The presence or absence of this condition may be therefore of some diagnostic value in determining between prolapsed internal piles and prolapsed rectum.

2. The *hyperplastic pile* is always associated with a breach of the muco-cutaneous surface just at the lower border of the internal sphincter. The chief exciting causes are abrasions, fissures, or ulcerations of whatever nature that have been engrafted upon this locality. The resulting swelling in this instance is analogous to the swelling of loose cellular tissue in other parts of the body following a breach of its cutaneous surface, which subsides and disappears with the healing of the breach. But if the irritation is continued for a sufficient length of time there will result a hyperplasia of the contiguous skin and subcutaneous connective tissue, forming at the anal margin a flattened and pendulous tumor, or, as it is generally called, a cutaneous "tag." A common instance of this form of cutaneous pile is seen in connection with fissures, and as fissures occur most often posteriorly, the existence of an acutely-inflamed cutaneous pile in this region is pathognomonic of an ulceration just above it.[13] Ulceration of the lower rectal mucous membrane with its lowest termination just emerging from the lower border of the internal sphincter is a very frequent cause of the hyperplastic pile. The cutaneous pile associated with stricture of the rectum low down[14] belongs to this class, and when found in this connection I always regard it an evidence of the ulceration having extended as low down as the anal margin. Cutaneous piles, resulting from surgical operations in this region, where there has been some delay in the healing process, also belong to this class. The hyperplastic pile is somewhat hard and firm to the touch, and its two opposing surfaces are not readily movable upon each other, owing to more or less hyperplasia of the subcutaneous connective tissue. As I have already remarked, it is flattened and pendulous, with a more or less elongated and narrow base, which may or may not correspond to the central or anal end of one of the normal radiating folds. During the acute or growing period of its existence this pile is exquisitely sensitive from œdematous swelling, and is a source of great annoyance, while in the chronic state, after the exciting cause has been repaired, the pile assumes a state quite similar to the redundant pile, with no particular symptoms other than the inconvenience arising from its size; but it is to be distinguished from the redundant pile by its harder and firmer feel and by more or less adhesion of its opposing surfaces. In this, as in all cutaneous piles, repeated attacks of œdematous swelling occur, each attack adding materially to the hyperplasia, or the inflammation may terminate in suppuration. Thrombi, it is true, may occasionally be found in the

hyperplastic pile.[15] In this event, however, their presence is accidental and not at all to be considered as a cause of the pile, the altered condition of the tissue through which the vein passes causing retardation and stasis of the blood current, producing what Bilroth calls "thrombus from compression."[16] The cutaneous pile, resulting after incision or suppuration of the thrombotic pile alluded to above, belongs to this class.

3. The *hypertrophic pile* is the condition in which the muco-cutaneous integument is left after recurrent and long-continued attacks of eczematous inflammation from whatever cause, such attacks occurring not infrequently in this locality. The congested, thickened, and infiltrated integument, with exaggeration of the natural folds and furrows aggravated by rubbing and scratching, is left after subsidence of the inflammation more or less hypertrophied. The resulting hypertrophy is most marked in the natural radiating folds, a characteristic point being that the enlargement is present in the entire length of the fold. From the exudation which accompanies this inflammation the hypertrophied folds are kept continually moist, giving them a whitish and macerated appearance, completely obscuring the pigmentation normally present in the part.[17] From the association of this cutaneous pile with an eczematous inflammation it is often assumed that the presence of the pile is the cause of or a source of aggravation to the eczema,[18] and the removal of the hypertrophied folds is recommended as a salutary measure. This view, it seems to me, is fallacious, inasmuch as the cutaneous pile stands in no way as an etiological factor of the eczema, but the eczema is the cause of the pile,[19] and the indiscriminate removal of the *hypertrophic pile* would produce a condition far worse than the disease for which it was supposed to be responsible.

The main object of this contribution is to emphasize the important fact in the etiology and pathology of external piles that certain preexisting abnormal conditions are indicated whenever such piles are found. It follows as a natural sequence that successful treatment of this affection demands a knowledge of the etiology. The clinical features and treatment will be considered at length in following communications. It may be noticed here, however, that the necessity of so radical a measure as excision will be limited to the *hyperplastic pile*, the mechanical inconvenience of which may demand this operation. For the relief of the *thrombotic pile* incision alone will in most cases suffice.

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TETANY IN AMERICA.[1]

With a Report of Five Cases.

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Although frequent enough in many parts of Europe, tetany is of sufficiently rare occurrence in this country to warrant the report of the following instances, and to render interesting a review of the cases published in America.

Considerable confusion exists regarding the exact application of the term "tetany." Certain writers would confine it to those cases in which there is a very marked intermission in the spasm, reserving the word "arthrogryposis" for those in which the contraction is more continuous. The condition described as "carpo-pedal spasms" is by some writers considered quite distinct from tetany, and by others, as, for instance, Fagge, viewed as a minor form of it. Strümpell denies the existence of tetany in early childhood, and Henoch draws the line sharply between the disease as seen in children and in adults. Others, as Schlesinger, speak of a tetany and a psuedo-tetany, making the distinction largely on etiological grounds. Some would exclude all cases which do not exhibit marked increase of the mechanical and electrical excitability of the nerves and muscles, while others, admitting the great frequency of these conditions, do not consider them as essential to diagnosis.

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[1] Read before the Association of American Physicians. Washington, May, 1894.

Finally, several distinct varieties of tetany have been described—as, for instance, rheumatic tetany, chronic tetany, tetany following thyroidectomy, and tetany due to dilatation of the stomach.

The more one studies the subject the more impossible does it seem to establish any line of demarcation between the different forms of the disease. There are numberless gradations between the conditions of well-marked, widespread, intermittent contractions, and of the continuous or intermittent carpo-pedal spasms. Then, too, some cases exhibit intermittent contractions at one time and continuous at another, or intermittent in one part of the body and continuous in another part. Not every case shows all the cardinal symptoms, including those described by Trousseau, Chvostek, and Erb. While, therefore, it is very possible that two or more diverse conditions may be included in the term, in the present state of our knowledge it seems best to define tetany as a disease consisting of tonic spasms either continuous or paroxysmal; usually symmetrical; affecting especially the extremities, but often widespread or sometimes confined to one limb; not accompanied by unconsciousness and not depending upon any irritative lesion of the brain, cord, or nerves, or upon hysteria.

Tetany has been so thoroughly described in other countries during recent years that any account of its symptoms would be out of place before this body, and I may now simply present the clinical histories of the cases which I have seen. I regret that the details are in some particulars far from complete.

Case I.—Willie McG., aged nineteen months; fairly well nourished; had several eclampsic convulsions when about two weeks of age; pneumonia at about one year. No note made of the existence of rickets or other form of ill health. About March 17, 1886, he began to vomit and continued this until the 21st. On the 20th he commenced to scream and his eyes turned up and often crossed. The thumbs became flexed into the palms; the fingers firmly bent at the metacarpo-phalangeal articulations, but straight elsewhere and adducted; the wrists flexed; the feet and toes extended. The hands and feet had a somewhat blue and swollen appearance. By the next day all spasm was gone, but by the afternoon of the 23d (two days later) all the symptoms had returned. The abdomen was swollen and tender. During the night following there was some stridulous breathing after cough, and on the 24th the spasm of the extremities was still present, although the eyes were now unaffected. Effort made forcibly to overcome the contraction caused screaming. The bowels were constipated; the tonsils enlarged, and they and the pharynx somewhat red; some mucous râles were audible in the chest. The record made on April 1st, one week later, states that the contractions were still present to some extent. The child let the hands hang most of the time with the wrists flexed, and he could not seize a pencil at all easily. He would crawl on his hands and knees instead of on his hands and feet, as was his custom when well. On April 14th it was recorded that full power had returned. About April 21st he developed rubella, which was preceded and accompanied by severe diarrhœa. April 22d, he awoke screaming, the contractions having suddenly returned in full force. The screaming lasted only a short time, but efforts forcibly to straighten the limbs brought it on again. In about three hours the spasm passed away. There was no further trouble until June 14th, when vomiting and diarrhœa with cough set in and continued, and on the morning of the 18th crying with flexion of the thumbs and wrists and extreme extension of the toes developed. The child kept putting his hands to his feet as though the latter were the seat of pain. He was better in the afternoon, worse at night, and on the next day much as when first seen, except that the fingers were straight and separated from each other. There was no pain except on passive motion. Nothing further was heard of the patient for some years, when I learned that there had been attacks of tetany on several occasions. About three years ago he died of some obscure meningeal affection in the Children's Hospital of Philadelphia. No autopsy could be obtained.

This case illustrates well the close etiological association of tetany with gastro-intestinal disturbance. Pain, it will be noticed, occurred only when the attacks began or when the parts were handled. The stridulous respiration heard on one occasion indicated a tendency to laryngismus, the close connection of which with tetany is so well understood. The separation of the fingers seen in the attack in June is worthy of remark, as it differed from the accoucheur's position more commonly witnessed. For the most part the contractions in this case lasted several days or a week or more, and should therefore be called continuous. On other occasions they were of short duration, lasting but a few hours or a day, and cannot be placed in this category.

CASE II.—Charles S., light mulatto, aged two years, was brought to the out-patient department of the Children's Hospital, May 1, 1889. The mother stated that for five months he had had difficulty in swallowing, solid food being taken more easily than liquid. The latter made him choke so that he grew "black in the face" and had to be beaten on the back to make him breathe again. He had also at times difficulty in breathing, the inspiration having a distinctly crowing character. The mother further stated that he sometimes had "spasms" in which the fingers were drawn inward and the wrists flexed, and that this condition would last for "some time." Examination of the child showed him to be a well-marked case of rickets. While in the clinic room his respiration was distinctly noisy, but the clinical notes indicate that it was rather the expiration than the inspiration. This may have been an error. He was ordered cod-liver oil and rock-salt baths, but he did not return. Several futile attempts were later made to see him in order to study his symptoms more fully. About a year later I learned that he had continued to have the attacks of tetany at intervals.

The brief and incomplete notes of this case serve at least to illustrate the close connection between rickets, laryngismus stridulus, and tetany.

The nature of the difficulty in swallowing is not clear. Very probably there was a spasm of the muscles of deglutition accompanied by a spasm of the larynx.

CASE III.—Peter W., aged forty-eight years, a well-developed and muscular negro, was brought by the police patrol to St. Agnes Hospital, July 15, 1890, the attack having come on him suddenly while at work. His family history was good, with the exception of the death of his mother from phthisis. He had had "typhoid pneumonia" nine years previously, and had had the ordinary diseases of childhood. He stated that ever since birth he had suffered from "cramps" about once a year, but that for the last few years they had occurred more frequently. He had an attack in the autumn of 1889, another in May, 1890, and a third two weeks before coming to the hospital. They consisted of muscular cramps which were sometimes very painful and which usually began in the hands or feet and extended throughout the body.

The feet would be drawn into dorsal flexion, the knees and hips extended and stiff, the thumbs bent into the palms and the fingers closed tightly over them, the wrists flexed, the elbows flexed and drawn to the sides, and the head held stiff. The jaws would be tightly closed, or sometimes could be opened and not shut again. The breathing would be painful and difficult, and the man feel as though each moment would be his last. The attack would come on slowly and increase in severity. At its height the spasms would be somewhat remittent, lasting some minutes, and then partially relaxing, while the greatest intensity of the pain shifted from one part of the body to another. The whole duration of an attack would be four or five hours.

When admitted he was in great pain and bathed in profuse perspiration. He had a temperature of 97° F., and a full and strong pulse. He was unable to pass water. The spasm and pain made walking impossible. The muscles of the neck, back, and extremities were involved, but particularly those of the latter. The neck was stiff and there was occasionally slight arching of the back, the weight resting mainly on the shoulders and the nates. The muscles of the calves were as hard as iron and the pectorals stood out like eggs under the skin. The individual paroxysms lasted one or two minutes and were followed by complete relaxation, lasting five or ten minutes. An exceedingly anxious expression of face accompanied the onset of the convulsions, which the man dreaded greatly. The spasm never seemed to be present with equal severity everywhere at once, but showed its greatest intensity now in one portion of the body and now in another. The upper extremities, however, were much more frequently attacked. A curious feature of the case was the fact that if the forearm or leg happened to be in the position of extension at the time of the onset of a spasm, the member stiffened in that position; and the converse was true if it was in flexion. There was no affection of speech. The patient appeared able to open the mouth and move the tongue readily. Percussion of the pectoral muscles during the intermissions produced a momentary vigorous contraction. There was marked anæsthesia of the lower portion of the body as far upward as the umbilicus, the man being unable to feel the prick of a pin.

The spasms diminished in intensity in the course of a couple of hours, after hypodermatic injections of morphine and atropine had been administered; but they returned later in the day, and appeared even through the next day, the 16th, although with less severity and frequency. On the 17th he felt sore all over and the muscles were tender, but there was no more spasm. Nothing abnormal was found on physical examination of the chest and abdomen. The thyroid gland was unaltered. On the 19th it was observed that compression of the upper arm produced a cramp-like pain in the forearm and a flexion of the wrist. This was relieved when the pressure was removed and friction of the muscles employed. The abdominal, cremasteric, and plantar reflexes were normal. The knee-jerk was absent, even with reinforcement. Efforts to induce ankle-clonus produced slight cramp in the calf muscles. Pressure over the exit of the facial nerve was followed by slight twitching of the muscles of the face.

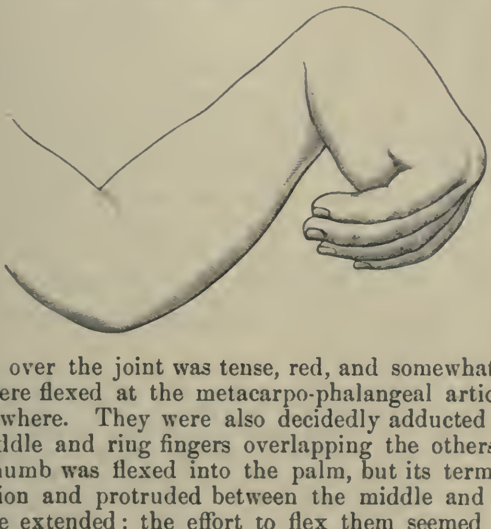
The man had no more trouble while under observation. On the 23d, eight days after admission, it was noticed that there was no longer any anæsthesia of the lower extremities. The knee-jerk was still absent. The course of the attack had been afebrile. About a week after his entrance into the hospital, Dr. G. Betton Massey kindly tested his electrical reactions for me. There was found distinct quantitative increase of the general electrical excitability of the muscles. This was not more marked in any one muscle than in others. No qualitative changes were discovered and the normal formula was invariably present. There was "a decided increase in the electro-muscular sensation, a gentle contraction causing a pain that resembled that of the tetanic attacks."

This instance of tetany is the only one of my cases occurring in an adult, and even here the disease began very early in life. The case is of interest on account of the severity and the wide extent of the spasms. The contraction caused by tapping the pectorals is an instance of the mechanical irritability common in this disease, as is the well-known facialis symptom of Chvostek, also present in this case. Trousseau's symptom—the production of spasm by pressure upon the artery or nerve, especially of the arm—and the increased electrical excitability—Erb's symptom—were also witnessed. Inability to urinate, from which the man at first suffered, and anæsthesia have been recorded by others also as occurring in this disease. The closing of the fingers over the thumb is not so common as the extension at the metacarpo-phalangeal joints.

CASE IV.—Emily W., aged three and one-half years. She was stated to have had good health until the occurrence of severe diphtheria four months before. As she was convalescing palsy set in, involving principally the muscles of the pharynx and lower extremities. Nearly fatal heart-failure is said to have occurred on several occasions. There was no history of the existence of any pain. She recovered very slowly from this condition, and by the end of twelve or fourteen weeks from the onset of the diphtheria she could walk only a few steps. Soon after this she was taken while in church with a severe attack of fainting and had to be carried home. In the afternoon of the same day fever developed and continued during three days. Then, for three days she suffered constantly with great pain, especially when handled. She seemed unable to get into any comfortable position. The pain then suddenly and entirely ceased and simultaneously the hands passed into the bent position, which was, it is said, as marked at the beginning as when I first saw her. Pain did not recur except on passive motion. This condition persisted without intermission for three weeks, during which she was kept in bed; and she was then placed in the wards of the Children's Hospital, October 11, 1892.

On examination, she was found to be a well-developed though decidedly irritable and somewhat delicate-looking child. There was no evidence of rickets. She sat in apparent comfort in bed. The hands were flexed at the wrist to quite a right angle, as shown in the illustration, and the skin over the joint was tense, red, and somewhat œdematous. The fingers were flexed at the metacarpo-phalangeal articulations, but extended elsewhere. They were also decidedly adducted toward each other, the middle and ring fingers overlapping the others to some extent. The thumb was flexed into the palm, but its terminal phalanx was in extension and protruded between the middle and ring fingers. The feet were extended; the effort to flex them seemed to give pain, but the irritability of the child rendered it difficult to determine how much actual suffering was produced. It was clear, however, that the manipulation of the hands was very painful. The knee-jerks were absent. Rest in bed and bromide of potash were ordered for about a week, but without benefit, and iodide of potash was equally useless.

FIG. 1.



No change could be observed in the condition for some weeks. Even during sleep the contraction continued, and attempts made to overcome it roused the child with the pain. The patient's irritability and the constant contraction at the wrist prevented at this time any successful attempt to bring on a spasm by compression of the upper arm. Tapping or stroking the face in front of the ear was not followed by muscular contraction. On several occasions the endeavor was made to determine the electrical reactions, but without success, owing to the fear and crying which resulted.

On November 2d, six weeks after the onset of the attack, the child permitted the extension of her hands to a considerable degree and without complaint, if her attention were diverted. She kept them, however, when at rest, in the same position as at first, and was as little able to use them. Persistent careful efforts were now daily made to straighten the hands by manipulation and by placing large balls of raw cotton in the palms. By November 8th there was decided lessening of the spasm, perhaps the result of great improvement in the general health. By November 14th, eight weeks after the onset, the hands were almost entirely relaxed, and, although the thumbs were still in the palms, the child could handle a doll awkwardly. On this date firm compression of the upper arm caused complaint of pain and a slight increase in the flexion of the hand. The feet were no longer extended.

She now improved rapidly, and by December 1st was practically well. When she first recommenced walking, on November 20th, she complained of pain in the feet and cried when they were handled. Later, she developed at different times measles, pertussis, and severe ulcerous stomatitis, but without the return of the tetany, and on May 15th she was in excellent condition, hearty, and well-nourished.

This case is in some respects an interesting one. The position of the wrists in constant flexion, combined with the history of former paralyses, suggested the possibility of a wrist-drop resulting from the diphtheria. A brief study of the patient, however, showed that there was positive contracture. Other interesting features were the sudden cessation of a three days' severe pain simultaneously with the development of extreme contraction; the persistent absence of the facialis symptom and of any discoverable cause for the tetany other than the diphtheria weeks before. The presence of œdema of the articulations is a common feature where the flexion is persistent.

Case V.—Emma S., six weeks old, was brought to the Children's Clinic of the Hospital of the University of Pennsylvania on December 6, 1892. She had been fed at the breast and was fairly well nourished. She had had no illnesses, except occasional colic and eructation of gas, and she had not been fretful. Two weeks previously the mother had noticed that the child cried whenever picked up or when its legs were moved, and that its knees were constantly held flexed. She stated that this condition had persisted without intermission, and that the effort to straighten the joints caused crying.

The examination made on December 6th showed that the knees were partially but not rigidly flexed, and that efforts to extend them were painful and caused the hamstring tendons to stand out as hard cords, and the tissues over the knee-caps to appear baggy and wrinkled—apparently the result of stretching by the constant flexion. The knee-jerks were normal. Further physical examination revealed nothing out of the way. The child was ordered bromide of potash and antipyrine, with inunctions of warm oil over the tense tendons. By December 13th, one week later, the legs could be extended more easily and with less pain. Former treatment was replaced by a cough mixture, which a slight bronchitis demanded. By December 19th the legs were decidedly better and the child could herself extend them to a considerable degree. By December 28th, three weeks from the first visit, the legs were still improving, but the baby was losing weight. It had been suffering for a week from diarrhœa, vomiting, and colic, and the mother's milk was rapidly growing so thin and insufficient that artificial feeding was deemed necessary. After this date the legs continued to improve; the gastro-enteric symptoms became temporarily better, but soon returned with increased force. On or before January 11th—*i. e.*, about a month after the first visit—the legs were completely relaxed; but on this date the arms became rigidly flexed at the elbows, the wrists slightly bent, and the thumbs drawn into the palms. When seen two days later the condition was a little better: the flexion of the left elbow had ceased, the fingers were freely movable, but the thumb was still incurved. On the right side the elbow was still bent, the wrist not so much; the fingers overlapped each other and were strongly flexed over the thumb. Efforts to straighten the right arm caused pain. Compression of the left arm was not followed by contraction, and neither pressure over the exit of the facial nerve nor stroking with the finger in front of the ear had any effect. The knees were still free from spasm. There was severe bronchitis in addition to the vomiting. Electrical examination made about this date by Dr. Evans, of the Clinic for Nervous Diseases of the University of Pennsylvania, showed a quantitative diminution of both faradic and galvanic contractility, but no alteration of the formula.

For two months from this time, *i. e.*, until the middle of March, the child lost ground steadily in health and became greatly emaciated, although vomiting occurred only occasionally and there was no diarrhœa. A flat, papular, widely-diffused syphiloderm had made its appearance. The tetany had returned in the left arm, and the elbows of both sides remained always more or less flexed, the thumbs always bent in and the fingers generally clasped over them, and only movable with considerable force. The wrists were not flexed and the knees were only occasionally bent. The feet had assumed the position of marked dorsal flexion, and retained this much of the time. Efforts to straighten the arms always caused pain. After the middle of March the child's general health began to improve rapidly and the tetany grew much less evident. By March 27th, three and a half months after the first visit, it had gained much in nutrition and weight, although still a miserable specimen. The eruption had spread. The elbows were still slightly flexed; the thumbs were constantly in the palms, and the child cried when they were forcibly withdrawn. There was no spasm elsewhere. Trousseau's and the facialis symptoms could not be obtained.

Up to May 1st the baby had continued to improve, and the contractures by this date were entirely gone except in the thumbs, which were still always flexed into the palms, although not so firmly as before. The eruption was disappearing under the influence of mercurial inunctions. Soon after this a change in the food brought on a return of vomiting, together with a reappearance of the contractures in both elbows. The weather was now hot, and the patient became exhausted, although vomiting had ceased. It died on May 24th, six months after the onset of the tetany. There was no autopsy.

This case is peculiar in several respects. The contracture starting at the knee-joint and persisting there for weeks without involving other parts is certainly an unusual mode of onset. The suspicion was at first aroused that the condition was one of congenital contraction of the tendons; but the later development of contractures at the wrists and elbows, apparently consecutive to gastro-enteric disturbance, made the diagnosis of tetany reasonably sure. Possibly the quantitative diminution of the electrical excitability may have been due to the great muscular wasting. The case is, for the most part, an instance of continuous spasm. The flexion of the wrists lasted scarcely two days and may be called intermittent. The contraction at the elbows was continuous, although with decided remissions and exacerbations. The contraction at the knees was continuous until they gradually assumed the normal position, after which it became distinctly intermittent. The flexion of the thumbs was obstinately continuous for at least four months.

One is surprised at the paucity of records of tetany to be found in the medical literature of America. I have made a somewhat extended search for cases, both under the heading of tetany and under those of trismus, laryngismus, spasm, and so on, lest some instances of the first-mentioned disorder should be concealed under the names of the others. Undoubtedly numerous cases have occurred which have not been recognized by physicians, and still more, although recognized, have never been published. Undoubtedly, too, I have overlooked the reports of many. Still, the results of the search prove that tetany is undoubtedly comparatively rare in this hemisphere.

For reasons already indicated I have included cases of so-called carpo-pedal spasm, except such as were clearly the immediate prodromal evidences of eclampsia and certainly attended by unconsciousness; for the study even of the few American cases shows that it is impossible to regard carpo-pedal spasm as other than a mild exhibition of tetany.

The following are brief abstracts of the 72 cases which I have been able to collect, arranged, as far as possible, in chronological order—at least as far as the year of publication is concerned. It has been found impossible in these abstracts to make a sharp distinction between "continuous" and "intermittent" contractions. For the sake of convenience I have rather arbitrarily denominated those spasms as continuous which appear to have lasted uninterruptedly for more than two days, and those as intermittent which did not last longer than two days without permanent or temporary disappearance.

The Roman numerals are employed to designate the cases reported with more or less detail. The capital letters, in parentheses, indicate the brief references without description which have been made to cases other than these.

I. 1833. Eberle (*Diseases and Physical Education of Children*, 1833, 527).—Healthy child of nine months. Repeated attacks of laryngismus. "Spasmodic affection of the respiratory muscles" and opisthotonos lasting ten to twelve minutes. Feet and hands in typical continuous contraction.

II. 1844. A. F. Axson (*New Orleans Med. Journ.*, 1844, i. 45).—Girl, four months. Dentition thought to be cause. Attacks of laryngismus, sometimes with retraction of head; flexion of thumbs into palms; flexion of toes. Spasms last one-half to two minutes; occur often in day. Treated by cold to head.

III to VI. 1844. J. P. Epperson (*West. Journ. of Med. and Surg.*, 1844, 2d S., ii. 25).—Four children in one family; colored; all under one year. Frequent attacks of laryngismus, lasting few seconds or minutes; later with strabismus, continuous characteristic spasm of feet and hands, and occasionally slight spasm of arms and legs. Treated successfully with stramonium.

(A.) Three other children in this family had earlier died from same condition.

VII. 1848. J. F. Meigs (*Diseases of Children*, 1st ed., 1848, 424).—Boy, seven months. Chronic intestinal derangement. Continuous spasm of hands and feet, with swelling, lasting four months. Occasional spasmodic movements of face, arms, and body. Laryngismus frequent.

VIII. 1848. J. F. Meigs (*Ibid.*, 429).—Child, two years. Attack of tonic flexion of toes lasting a few hours; relieved by purgative.

IX. 1850. C. D. Meigs (*Diseases of Children*, 1850, p. 167).—Boy, six months. Frequent attacks of laryngismus simultaneously with intermittent contractions of hands and feet, opisthotonos, turning of head to right, general rigidity, and finally with development of general convulsions. Death in couple of weeks or less.

X. 1853. J. F. Meigs (*Diseases of Children*, 1853, 2d ed., 463).—Child, nine months; delicate; persistent digestive disturbance; open wound. General convulsions followed in few days by painful tonic characteristic spasms of hands and feet, nearly continuous for two months, with occasional remissions. Occasional tonic, chiefly intermittent, spasm of arms and thighs, and retraction of head and trunk. Later a relapse with laryngismus.

(B.) In a later edition Meigs and Pepper (*Diseases of Children*, 1870, 4th ed., 529) refer to "two other cases" in which the contraction was decided, but lasted a short time only. One of these is possibly Case VIII., detailed above.

XI. 1858. W. J. Kincaid (*Transac. Ohio State Med. Soc.*, 1858, xiii. 69).—Boy, four and a half months. For weeks had had laryngismus badly; then also began to have hands and feet spasmodically flexed in some severer attacks. Cured by cannabis and chloroform internally.

XII. 1859. R. R. McMeens (*Cincin. Lancet and Observ.*, 1859, ii. 457).—Boy, twelve months. Well developed. Dentition and digestive disturbances considered the cause. Subject to laryngismus. Developed in addition characteristic [continuous?] spasm of hands and feet, with persistent flexion and partial paralysis of upper and lower extremities. Recovered.

XIII. 1862. V. J. Fourgeaud (*Pacific Med. and Surg. Journ.*, 1862, v. 303).—Girl of nineteen months. No cause discoverable except general weakness and emaciation. Nearly persistent tonic spasm of lower half of body; momentary partial relaxations. No evidence of pain. Spasm present during sleep. Spasm gradually became intermittent. Whole duration about six weeks. Disease at first simulated a spinal spastic palsy, as legs were crossed.

XIV. 1866. L. H. Carpio (*Gac. Méd. de México*, 1866, ii. 222).—Blacksmith, fifty years old. Superficial wound of abdomen, and few hours later abundant sweating; slight trismus of left side with powerful painful contractions of left side of neck. Paroxysms intermittent; induced by moving head or coughing. Entire relaxation and no pain between paroxysms. Attacks ceased in five days.

XV. 1871. Arnold (*Balt. Med. Journ. and Bull.*, 1871, ii. 347).—Nursing woman of thirty-two years. [Appears to have been intermittent] tetany of left side of face, right arm, and slightly of right leg. Sometimes pain in nape of neck. Trousseau's sign present. [Report very incomplete.]

XVI. 1871. Zuñiga (*Gac. Méd. de México*, 1871, vi. 377).—Blacksmith, twenty years; old suppurating wound. Exhibited trismus, tetanic physiognomy, copious sweating, spasm of muscles of abdomen, neck, trunk, and lower limbs. Difficult respiration [spasm of intercostal muscles?]. Trismus chiefly persistent. Other contractions more intermittent. Condition had lasted twenty-four days when reported, although improving under chloral.

(C.) Zuñiga (*Ibid.*) says that another case of tetany had been in the hospital a few days before.

XVII. 1872. W. R. Nichols (*Canada Med. Journ.*, 1872, viii. 161).—Boy, sixteen years. Gradual onset; no cause given. Trismus, contortion of face, spasm of muscles of neck and back [opisthotonos], abdomen, and limbs. [No notes regarding hands and feet.] Pupils dilated and oscillating; strabismus; difficulty in swallowing. Spasm continuous, with remissions only. Excitement made worse; no cramp-like pain. Trousseau's symptom present. Recovered after three weeks' treatment with iodide of potash followed by bromide of potash.

XVIII. 1875. M. Alfaro (*An. Asoc. Larry, México*, 1875, i. 97).—Healthy man, thirty years. Slight faintness and tingling in lower limbs ushered in general tetanic rigidity with trismus, distorted features, contracted pupils, adduction of thumbs, extension of feet, legs, thighs, and arms. Respiration interfered with. Four attacks in a few hours, each lasting ten to fifteen minutes. Similar attacks since age of fifteen; first shortly after death of mother; others usually after psychic disturbance.

XIX. 1876. J. S. Green (*Transac. N. Y. Obstet. Soc.*, 1876–78, i. 160).—Delicate girl, four years old. After an attack of diarrhœa there developed intermittent spasms of feet, legs, hands, and forearms, lasting two to five minutes, with some degree of persistence between them. In one paroxysm there was opisthotonos. Position of hands characteristic. Paroxysms so painful that anæsthesia with chloroform required for six hours. Disease lasted in all about forty-eight hours.

XX. 1877. N. B. Emerson (*Transac. Amer. Neurolog. Assoc.*, 1877, ii. 179).—Girl, twelve years. After suppression of first menstruation there was pain in right arm and leg followed by continuous contraction lasting a few days. Hands and feet in characteristic position. Then similar attack of left side, preceded by numbness and tingling. Salicylic acid followed by recovery. [As a result ?]

XXI. 1877. N. B. Emerson (*Ibid.*).—Male, eighteen years; delicate. Disease began at age of four years, possibly then associated with some affection of brain or cord. Painful spasm, sometimes one arm, sometimes whole body; oftenest arm and leg of one side. Contraction continuous night and day and characteristic; lasted usually two to three days up to ten days. Respiration sometimes difficult. Attack generally preceded by numbness and evidences of indigestion. Trousseau's symptom not obtained; perhaps result of chloral given. Recovery under use of conium.

XXII. 1879. S. Weir Mitchell (*New York Med. Record*, 1879, xv. 604).—This and the following case seem very probably anomalous instances of tetany. The writer gives them no name, but describes them as due to obscure functional conditions.

Boy, seventeen years; fair health. Forty-eight hours after exposure to intense heat had dull pain in the legs followed next day by great, continuous rigidity of legs. Passive motion caused pain. Recovery in three weeks.

XXIII. 1879. S. Weir Mitchell (*Ibid.*).—Man, forty-three years, well developed. Pain in back and legs, with increasing stiffness, followed in a few hours by fully-developed attack. Legs extended, moderately stiff; but least handling caused severe, intensely painful spasms of legs, feet, and abdominal muscles. Recovery in sixteen hours under narcotics. Two previous similar attacks.

XXIV. 1879. C. K. Mills (*New York Med. Rec.*, 1879, xvi. 218). —Girl, thirteen years. Rheumatism, and later diarrhœa. Painful continuous spasm of extremities; elbows flexed; wrists flexed and abducted; thighs and feet extended. Handling left parts painful; knee-jerks increased. Recovered in two weeks with cure of diarrhœa by silver and opium.

XXV. 1879. H. P. V. Petershausen (*Detroit Lancet*, 1879–80, iii. 248).—Man, twenty-eight years; healthy; history of blow on head, possibly connected with the tetany. Disease had lasted six years. At one time there had been a very persistent hemiplegic condition, which finally disappeared. When seen were intermittent paroxysms of left arm and hand, neck, and facial muscles, every three or four minutes, lasting thirty to one hundred seconds. [Not clear whether legs involved.] Some œdema of hands and face. Attacks preceded by stiffness and pain. Some paralysis of left arm and difficulty of speech during paroxysms and intermissions. Recovery in four weeks under chloral.

XXVI. 1880. A. H. Sowers (*Proc. Nebraska Med. Soc.*, 1877–80, 186).—Adult male; subject to severe dyspepsia; had a fall and suffered some shock, and a few days later tetany developed. Intermittent spasm of whole right side, with slow respiration. Pain in head and staring expression; disposition to sleep. Disease had lasted three months.

XXVII. 1882. J. O. Hirschfelder (*Pacific Med. and Surg. Journ.*, 1881–82, xiv. 385).—Adult male; fall in elevator five days before first attack. Symptoms not detailed, but Hirschfelder showed to his class that pressure on axillary nerve produced general rigidity, retraction of head, and well-marked tetanic convulsions; relieved when pressure was removed.

XXVIII. 1884. I. W. Smith (*Amer. Journ. Obstet.*, 1884, xvii. 438).—[Case reported under title "Trismus Nascentium;" possibly an instance of tetany.] Child three days old. Continuous flexion of lower limbs; inversion of feet; distortion of features; fingers variously distorted; spasm increased by efforts at passive motion. [No trismus mentioned, and] child could suckle and swallow from a spoon. Humeri dislocated forward.

XXIX. 1885. J. Stewart (*Med. News*, 1885, xlvii. 50; later, more completely, in *Transac. Assoc. Amer. Phys.*, 1889, iv. 33).—Male, thirty-nine years; long suffered from chronic diarrhœa. No trace of thyroid gland. Attacks exhibited double vision; intermittent characteristic spasm of hands, adduction of arms, flexion of forearms; contraction of facial muscles, and occasionally spasm of lower extremities. Numbness, pain, swelling, and sometimes herpes of hands. Attacks recurred for about ten days. Disease had lasted eight years. Increase of galvanic and of mechanical excitability. No reaction of degeneration. Knee-jerk increased during an attack; later, absent or weak.

(D.) W. A. Hammond states in a clinical lecture (*N. E. Med. Monthly*, 1885–86, v. 479) that he has seen a few cases; also, that he is not aware of any cases reported in America.

(E.) G. Ross (*Med. News*, 1885, xlvii. 51) states that he has seen but few cases.

(F.) Godfrey (*Ibid.*, 51) says that he has seen several cases.

XXX. 1886. H. M. Lyman (*Transac. Assoc. Amer. Phys.*, 1886, i. 99).—Delicate man, twenty-eight years. Attacks apt to follow over-eating. Spasm of arms and legs; opisthotonos. Respiration sometimes difficult; occasionally severe headache. Attacks lasted from one to four minutes, and recurred every five to thirty minutes for one or two days; six to eight in a year. Each attack began with forcible beating of right arm against chest.

XXXI. 1886. H. M. Lyman (*Ibid.*).—Nervous man, twenty-two years. Attacks of cramp in left hand, forearm, and sometimes shoulder and side of neck. Intermittent.

XXXII. 1886. H. M. Lyman (*Ibid.*).—Hysterical girl, nineteen years. Exhibited Trousseau's symptom in hand and wrist. [No other note of case.]

XXXIII. 1886. H. M. Lyman (*Ibid.*).—Boy, nine years. Intermittent, painful contractions of flexor muscles of hand and forearm. Fingers flexed over thumb.

XXXIV. 1886. H. M. Lyman (*Ibid.*).—Girl, seven years. Spasm of muscles of neck, arms, hands, feet, and legs, and sometimes of thorax, abdomen, and face. Sometimes laryngismus. Attacks began in hand; three to fifteen paroxysms a day.

(G.) H. M. Lyman (*Ibid.*) states that he has seen the "milder variety of tetany" in young children usually suffering from diarrhœa; characterized by flexion of thumbs into palms, often with fingers flexed over them.

XXXV. 1886. A. Jacobi (*Transac. Assoc. Amer. Phys.*, 1886, i. 106).—Young man in whom act of masturbation always brought on attack. Disease did not appear until age of puberty.

XXXVI. 1886. J. T. Carpenter (*Transac. Assoc. Amer. Phys.*, 1886, i. 105; later, more exactly, in *Ibid.*, 1889, iv. 44).—Boy, thirteen months; abscess. Turning of eyes to one side; typical contraction of arm and hand, first on one side, then on the other; trismus persistent. All spasm relaxed about third day, then returned; death in a week. [This case is very powerfully suggestive of tetanus.]

XXXVII. 1887. F. C. Shattuck (*Boston Med. and Surg. Journ.*, 1887, cxvi. 497).—Healthy boy, nineteen years; had stiffness of jaw for year. This suddenly grew worse, and there appeared numbness, [intermittent (?)] spasm of hands and arms and slightly of legs. Hands in characteristic position. Masseters hard. Pain only on passive movement. Considerable mental excitement. Speech difficult. Trousseau's symptom and increased electrical excitability could not be obtained. Condition relieved in three days under chloral and potassium bromide.

XXXVIII. 1888. H. Hun (*Med. News*, 1888, liii. 415).—Woman, twenty-six years. Suppressed menstruation cause of first attack. Deficient mental power. Disease had lasted two years. At first intermittent spasm, usually in arms and legs; position of hands and feet characteristic. Later continuous, tonic spasm of all the muscles, excepting those of face, persisted even during sleep. Were also paroxysmal painful augmentations of the spasm. Trousseau's symptom present. Facialis symptom absent. The persistent contraction interfered with the study of the reflexes and electrical reactions. No improvement when case published, after nine months of observation.

XXXIX. 1889. J. T. Carpenter (*Transac. Assoc. Amer. Phys.*, 1889, iv. 45).—Girl, eleven months; suppuration of shoulder. Laryngismus and "muscular contractions of tetany." [The paroxysms were evidently intermittent.] Recovered, but liable for several years to attacks after diarrhœa or taking cold.

(H.) F. P. Kinnicutt (*Transac. Assoc. Amer. Phys.*, 1889, iv. 47) remarked in a discussion upon the subject that he had seen two cases of intermittent tetany in connection with great dilatation of the stomach.

(I.) S. Weir Mitchell (*Ibid.*, 50) said that he had seen but two cases. These may have been Cases XXII and XXIII., already detailed.

(J.) W. Pepper (*Ibid.*, 51) stated that he had seen only one case, that being in a child.

(K.) A. Jacobi (*Ibid*, 48) stated that he had met with five cases, and possibly a few more. It may be that one of these was that referred to by him in 1886 (Case XXXV.).

XL. 1889. F. T. Miles (*Transac. Assoc. Amer. Phys.*, 1889, iv. 48).—Woman, twenty-two years. Dilatation of stomach; extreme emaciation. Had had numbness of fingers and toes on several occasions. Developed an attack of tetany with classical position of hands and feet; contraction about face and mouth; rigidity of eyes. Died in twenty-four hours.

XLI. 1889. C. W. Earle (*Transac. Amer. Pædiat. Soc.*, 1889, i. 153).—Girl, two and a half years; indigestion. Characteristic contractions with pain and swelling of hands and feet; muscles of posterior part of legs involved. Spasm continuous. Well in five days. Fomentations and nerve-sedatives.

XLII. 1889. C. W. Earle (*Ibid.*).—Girl, six months. Painful continuous spasm and swelling of hands and feet, lasting ten days.

XLIII. 1889. F. C. Shattuck (*Boston Med. and Surg. Journ.*, 1889, cxxi. 231).—Girl, twenty-one years. Diphtheria when sixteen, followed by tetany. At first attacks in one hand and arm, occurred rarely, lasted one to two minutes; gradually all extremities, more frequent, sometimes lasted an hour. Trousseau's symptom present. No inversion of electrical formula.

XLIV. 1889. S. L. Abbott (*Boston Med. and Surg. Journ.*, 1889, cxxi. 230).—Robust longshoreman, forty-three years. Spasm of all flexors of extremities, and to some extent of muscles about shoulders and abdomen. Occurred often every half-hour; lasted about a half-minute. Excited by muscular effort. Only slight pain. Improved rapidly under urethan.

XLV. 1889. J. L. Smith (*Arch. of Pædiat.*, 1889, vi. 374).—Boy, eleven months; improperly fed; constipated; one tooth. Had had disease for four months. Spasm [apparently continuous] of muscles in all extremities. Characteristic position of hands. At times spasm of legs and thighs. Attacks of laryngismus. Spasm continued during sleep. Recovered under potassium bromide and relief of constipation.

XLVI. 1889. J. L. Smith (*Ibid.*, 376).—Well-nourished child, twenty months. Dentition thought to have been the cause. Five teeth prominent at once under swollen gums. Flexion of left leg and thigh; [apparently continuous] for three weeks. Spasm present during sleep.

XLVII. 1889. J. L. Smith (*Ibid.*, 469).—Woman, thirty-nine years. Exposure to cold, wet, and fatigue. Intermittent pain from ankles to knees; in four months, constant; shortly after had continuous flexion of fingers, extension of feet, and flexion of toes. Spasm present during sleep. Sensation in toes nearly lost. Sphincter ani paralyzed for a time. Perspiration of extremities. Spasm of hands well in six months; that of feet still continuing after a year.

XLVIII. 1889. J. L. Smith (*Ibid.*, 472).—Girl, ten and a half months. Severe acute diarrhœa, followed by characteristic spasm of hands and feet with œdema. Several paroxysms during six days, each lasting a day or two, and present during sleep. Had attack of eclampsia on fourth day of disease. Treated with bromides and chloral and attention to bowels.

XLIX. 1889. J. L. Smith (*Ibid.*, 473).—Boy, fifteen months. Rickets; tendency to diarrhœa; earlier, an inclination to hold breath. Had had nearly continuous characteristic spasm of hands and feet for three months. Spasm present during sleep. Recovery under attention to diet and administration of zinc and atropine.

L. 1890. A. Abrams (*Occid. Med. Times*, 1890, iv. 14).—Man, twenty-four years; excessive smoker; dilatation of stomach. Painless spasms in left arm and sometimes also in left leg; rarely right arm alone. Sometimes occurred every day at hourly intervals. Violent movements provoked them. Impairment of all forms of sensation in left arm and leg. At times formication and coldness constituted prodromes. Left knee-jerk slightly increased. Trousseau's and Chvostek's symptoms and increase of electrical excitability present. Great exhaustion after attacks.

LI. 1890. J. Schneck (*Journ. Amer. Med. Assoc.*, 1890, xv. 387).—Girl, ten years. Disease had lasted two years. At first vertigo, with spasm of lower limbs; later only spasm of upper extremities, neck, jaws, and occasionally opisthotonos. Swallowing and speech interfered with; some pain attended. Hands and arms in classical position. Paroxysms averaged ten daily, each lasting a couple of minutes. Tinnitus, formication and numbness followed them. Trousseau's and Chvostek's symptoms and knee-jerk absent. Argyll-Robertson's pupil present. Disease disappeared in five or six weeks under conium and nitroglycerin.

LII. 1891. E. H. Small (*St. Louis Med. and Surg. Journ.*, 1891, lx. 271; also in several other journals).—Boy, eleven months. Rickets; digestive disturbance. Characteristic continuous spasm, at first painful, of hands and feet, with œdema and cyanosis. In week recovery under fomentations, potassium bromide, and attention to bowels.

LIII. 1892. N. E. Remmen (*Chicago Med. Recorder*, 1892, iii. 240). —Girl, fourteen years. Adenoid growths in naso-pharynx, with poor mental development. Painful spasms of extremities and rigidity of whole body, lasting five minutes and occurring every two months. Disease had lasted two years. Trousseau's and Chvostek's symptoms well marked.

LIV. 1892. S. S. Adams (*Arch. of Pædiat.*, 1892, ix. 881).—Boy, four months; digestive disturbances, phimosis, possibly rhachitis. Laryngismus and, several times, eclampsia. Later "snapping of lids," rolling eyes, flexion of thumbs into palms, and general rigidity attending laryngismus. These attacks several times daily. Death shortly after from laryngismus.

LV. 1892. W. S. Bowen (*Med. News*, 1892, lx. 434).—Girl, six days old, when she developed attacks of laryngismus with spasm of nearly all muscles of body; opisthotonos and characteristic position of extremities. Lasted about one minute; repeated frequently. [Clearly no trismus. No cause, unless wound left by dropping of cord on fifth day.]

LVI. 1893. B. E. Vaughn (*New York Med. Journ.*, 1893, lviii. 757).—This and the following six cases are instances of epidemic tetany; five of them were in one family; all were Italians living under most unfavorable conditions of dampness and bad air.

Woman, thirty-five years. Nursing; damp, close dwelling. Formication in feet extending to head, neck, and finally hands, with constipation and abdominal pain. Then characteristic spasms in upper extremities, and later in feet, three to four a day, each about one hour. Increased electrical excitability. Disease had lasted three months when first seen. Quinine cured in eighteen hours.

LVII. 1893. B. E. Vaughn (*Ibid.*).—Girl, fourteen years; just beginning to menstruate. Daughter of Case LVI. and developed disease two weeks later. Same exposure to dampness. Formication preceded onset of spasms, which were nearly continuous, relaxing only once or twice a week for a couple of hours. Position of hands and arms characteristic. Rapid recovery under quinine.

LVIII. 1893. B. E. Vaughn (*Ibid.*).—Girl, three years; rickets; same exposure to dampness as with mother (Case LVI.), and disease began about same time. Spasm in upper extremities twice a week only. Recovery under quinine.

LIX. 1893. B. E. Vaughn (*Ibid.*).—Girl, twelve years; menstruation recently established; lives in damp house with mother (Case LVI.). Formications, abdominal pain, and constipation as in that case; then continuous characteristic spasm of upper extremities. Trousseau's symptom present. Disease had lasted about two months. Recovered in less than twenty-four hours under quinine.

LX. 1893. B. E. Vaughn (*Ibid.*).—Woman, thirty-three years. Nursing; damp dwelling. Formications, as in Case LVI., for three weeks. Contractions [apparently continuous] began two days before seen. Were increased by pressure on brachial plexus. Disappeared after sixteen grains of quinine in two doses.

LXI. 1893. B. E. Vaughn (*Ibid.*).—Woman, twenty-five years. Damp dwelling; nursing; anæmic, looked sick, had fever and enlarged spleen. Formication as in Case LVI. Contractions [apparently continuous] in fingers and hands began four days before seen. Trousseau's symptom present. Recovered in less than twenty-four hours under quinine.

LXII. 1893. B. E. Vaughn (*Ibid.*).—Man, working in damp place; had typical spasm in both hands and feet.

(L.) B. E. Vaughn (*Ibid.*) states that quite a number of other cases came to the morning Italian class of the New York Dispensary; those reported above having been seen in the afternoon hour.

LXIII. 1893. A. S. Fraser (*Canadian Practitioner*, 1893, xviii.

500).—Man, thirty years. Severe dyspepsia due to cirrhosis of stomach as shown by autopsy. After acute indigestion developed intermittent spasm of muscles of face and extremities, with characteristic position of hands. Spasm lasted one to two minutes; had four in an hour; fifth stopped by puncture with hypodermatic needle. Then occasional slight spasms of extremities for some months, with declining health. Then death, preceded by severe spasms of extremities during three days.

LXIV. 1893. J. W. McConnell (*Journ. Nerv. and Ment. Dis.*, 1893, xx. 418).—Woman, thirty-three years. Took general cold. Numbness, pricking, and vague pain, followed by spasm of extremities, neck, abdomen, and zygomatics; tongue stiff, speech and respiration difficult. Muscles alternately relaxed and contracted during about one hour. Voluntary motion increased the spasm. Trousseau's symptom present. A second attack within twenty-four hours.

LXV. 1893. A. Jacobi (*Arch. of Pædiat.*, 1893, x. 1042).—Boy, three years; poorly developed; convulsions at seven months. Fingers bent and thumbs flexed into palms. [Not stated how long this lasted.] Considers chronic meningitis the cause.

LXVI. 1893. A. Jacobi (*Ibid.*, 1055).—Colored child [baby ?]; disturbed digestion or exposure apt to be followed by muscular spasms especially in the hands, with a "peculiar forced position of the limb lasting a day or two." Spasm returning perhaps in a week.

LXVII. 1893. D. J. Evans (*Montreal Med. Journ.*, 1893, xxii. 183). —Girl, seventeen months, colored; rickets. Characteristic spasm of hands and feet, with œdema, continuing ten days, then gradually relaxing. Facial reflex present; knee-jerk exaggerated; no pain. Tonic and dietetic treatment.

LXVIII. 1893. D. J. Evans (*Ibid.*).—Girl, ten months. Chronic diarrhœa, debility, probably syphilis. Five other children had died of convulsions. Continuous spasm of hands and feet, with exacerbations, lasting five days. No facial reflex. Dietetic treatment and potassium bromide.

LXIX. 1893. S. Brown (*North Amer. Practitioner*, 1893, v. 66).—Man, twenty-four years. Exposure to wet and fatigue. Painful spasm in calves and feet, lasting about half an hour, and occurring frequently for three days; worse at night. Increased galvanic excitability. Inversion of formula. Trousseau's symptom absent.

LXX. 1893. S. Brown (*Ibid.*).—Young man. Tingling of whole right side and spasm of right arm with flexed elbow and closed hand. Spasms lasted one to two minutes, and usually occurred four to five times before breakfast, and occasionally one or more times during the day. Increased galvanic excitability, inversion of formula and Trousseau's symptom present. Disease had lasted six weeks. Recovery in six days under potassium bromide and galvanism.

LXXI. 1893. S. Brown (*Ibid.*).—Man, twenty-seven years. Exposure to bad weather. Spasm on both "sides" [probably legs meant], lasting several months. [Not stated whether intermittent or continuous.] Says symptoms were well marked, and electrical examination confirmed the diagnosis.

LXXII. 1894. M. H. Fussell (*Univ. Med. Magazine*, 1894, vi. 229). —Girl, five years. Indigestion apt to induce laryngismus and painful characteristic contraction of hands and feet with flexion of elbows, retraction of head, and strabismus. Spasm continuous during a few days, then disappearing a few days. Exertion made worse; diversion of mind caused nearly to disappear. Trousseau's symptom and knee-jerk absent. Chvostek's symptom present. Disease occurred during several years, especially in spring and fall. Typical epilepsy later in course of case. Death from atelectasis resulting from laryngismus.

Some little analysis of these cases may be of value. Those which offer themselves as at all suitable for this purpose are the ones designated by the Roman numerals. They equal 72 cases in all. I have not included my own cases in this analysis, since they do not come in the category of those already published.

Conclusions drawn from the cases can only have a relative value, particularly where figures are concerned. This is true both because some doubtful instances of the disease are included in the list, and because many of the reports are incomplete or the meaning of the writers obscure.

In considering the etiology of the published cases we find that 34 of the patients were of or above the age of puberty when the disease first developed, including 3 girls in whom menstruation had just been established; 13 were children from two years of age to puberty; 25 were under two years of age, and 20 of these less than one year old.

33 of the patients were male, 29 female, and in 10 the sex is not stated.

Among the possible causes mentioned or implied, I find lactation (4 cases); open wounds (6); psychic disturbance, including 2 instances of shock from falls (3); menstruation, developing or suppressed (4); possible affection of the brain (3); digestive disturbances, including 2 cases of dilatation of the stomach (23); rheumatism or exposure to cold and wet (13); exposure to heat (1); diphtheria (1); dentition (3); syphilis (1); masturbation (1); absence of the thyroid (1); rickets (5); adenoid growths of the naso-pharynx (1); phimosis (1). Sometimes two or more of these causes were operative in the same case.

Under the heading of symptomatology we find it stated that pain in the affected part, apparently due to the spasm, was present in 21 cases, and that it was absent or trivial in 6 cases. In the others no reference is made to the subject. Further, we find among the principal symptoms or complications, faintness (3 cases); vertigo (1); herpes (1); tingling, numbness, formication, etc. (15); temporary paralysis (3); anæsthesia (2); disposition to sleep (1); tinnitus (1); epilepsy (1); laryngismus (17); eclampsia (4). European observers find laryngismus and tetany very frequently associated; and Loos, indeed, has maintained that the former is simply a laryngeal manifestation of the latter disease. Cheadle views laryngismus, tetany, and eclampsia as but different expressions of the same morbid condition. Possibly the association of tetany with one or the other or both of these allied affections has occurred in America oftener than the reports would indicate. It is interesting to notice that 15 of the 17 cases of laryngismus were witnessed in children under one year of age. Also, that in 11 of the cases the contractions were chiefly continuous and in 6 paroxysmal.

No numerical analysis can be made of the position of the spasm in the body, since it varied from an almost universal diffusion to a limitation to one limb. Trismus was present in probably 6 cases; possibly in a few more in which the reports do not make it quite clear. So, too, it is difficult to draw any conclusions with regard to the nature of the spasm, since we find all gradations occurring, and the writers, too, have not always expressed themselves clearly on this point. As nearly as I can determine the spasm was intermittent, in the sense already defined, in 38 cases and continuous in 25 cases. In 1 case (XIII.) it was at first continuous and later intermittent; in 1 (XXXVIII.) it was first intermittent and then continuous; and in 4 cases (I., VII., X., and XXXVI.) it was continuous in one portion of the body and intermittent in another. In 3 cases (LXII., LXV., LXXI.) the authors do not give even a clue to the nature of the spasm.

In only comparatively few cases is there any reference to the presence or absence of Trousseau's symptom and of increased electrical or mechanical excitability as described by Chvostek and Erb respectively.

The treatment, so far as it has been reported, has consisted chiefly in remedies employed as sedatives to the nervous system, or directed against the exciting cause of the disease. But very few cases have been fatal, and these only as the result of complications.

Finally, we can but conclude that the cases reported in America entirely uphold the view enunciated earlier in the paper, viz., that there is no essential difference between the tetany of adults and that of children, or between the continuous and the paroxysmal forms of the disease. The cases quoted in considering the nature of the spasm are all in evidence here. Moreover, continued spasm may exist in persons past the age of childhood (Case XVII.), contrary to the statements of some writers; and intermittent spasms, exactly similar to the commoner tetany of adults, are frequently seen in children. But were there no other instances in proof of the point advanced, the remarkable series of cases published by Vaughn would of themselves be sufficient. Here we find in one family, and at one time, one case (LVI.) of a truly intermittent type, another (LVII.) of a somewhat more continuous form, and a third (LIX.) showing very continuous contraction, yet with Trousseau's symptom present as proof of its true nature.

REPORT OF A CASE OF TRICUSPID STENOSIS ASSOCIATED WITH MITRAL STENOSIS AND AORTIC STENOSIS.

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AND

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The occurrence of tricuspid stenosis, while not so very rare, is yet sufficiently uncommon to lead us to believe that a report of the following case, in view of its many interesting features, will not prove uninstructive.

The history is as follows:

W. N., aged nineteen years, a japanner by occupation. Both parents are living and in good health, and in the family of neither is there a history of rheumatism.

The patient appeared to be healthy at birth. When six years of age he had measles, his childhood being otherwise uneventful until his fifteenth year, when he suffered from an attack of influenza. With the latter affection he was ill two weeks, but, while unable to attend to his usual work during that period, was not confined to bed. The chief symptoms of the influenza were referred to the head, bone pains being of very moderate degree. There is no personal history of scarlet fever, nor had the patient at any time suffered from what might be termed a frank attack of rheumatism, although at various times vague pains, somewhat rheumatic in character, had been complained of.

For the six years preceding his death the patient's occupation had been that of a japanner, and therefore one that entailed no very laborious exercise. Throughout his entire childhood he had lived a very quiet and retired life, and never indulged in the active pursuits of his playmates, although there never appeared to be, as his mother stated, any physical incapability. When first he accepted employment, however, in the year 1888, it was remarked that he could not walk to and from the factory, a distance of some thirteen or fourteen blocks, without suffering great fatigue. No especial cardiac symptoms showed themselves, however, until about four years preceding his death when, after a hard day's work, he would frequently complain of præcordial distress and cardiac palpitation associated with easily induced shortness of breath. Upon such occasions the violence of the cardiac impulse had been noticed, and it was of sufficient strength to make itself evident through the several layers of the patient's clothing. At that period, however, his color was good, and there existed no further evidence of ruptured compensation.

The patient first came under observation in the early part of March, 1894, at which time he presented himself for examination as an applicant for life insurance. So far as rational symptoms were concerned, he then appeared to be in the best of health, though the physical examination at once revealed the diseased condition of the heart, the diagnosis at that time being mitral stenosis and mitral incompetency. As such his case is included in a report of a series of cases of chronic valvular disease of the heart read before the College of Physicians of Philadelphia, by Dr. T. G. Ashton, at its meeting held June 6, 1894, and subsequently published in *The Medical News.*

Toward the end of March, 1894, the patient began to show signs of cardiac failure. Upon exertion, especially upon bending over, his face, which usually had a good color, would become decidedly blue, and even the slightest exertion was sufficient to induce shortness of breath.

The patient's habits had always been abstemious; he had never used alcohol or tobacco and, as previously stated, had never taken any interest in athletic exercises.

On June 23, 1894, he first made his appearance at the clinic of the out-patient medical department at the Jefferson Medical College Hospital. The notes of the physical examination made at that time are as follows: Marked cyanosis of the patient's lips, cheeks and hands; dyspnœa evident; puffiness of under eyelids and marked pretibial œdema; the radial pulses were imperceptible, and it was impossible, therefore, to obtain a sphygmographic tracing.

Inspection of the præcordium revealed a greatly extended impulse which was plainly perceived as far as the sixth interspace and one and one-half inches to the left of the nipple; there was marked pulsation in the epigastric region, which also extended well to the right of the sternum.

Upon palpation the cardiac impulse and apex beat were found to possess but little force. A feeble thrill was detected above the apex beat of the heart, the time of occurrence of which was presystolic; no thrill existed over the tricuspid area.

Auscultation at the apex revealed a systolic murmur, soft and of moderate intensity, which was plainly propagated into the left axilla. Above the apex, and at a point corresponding to the thrill above mentioned, was heard a murmur, presystolic in time, harsh in character, and terminating abruptly with what appeared to be the first sound of the heart. At a point below this, upon a level with the apex of the heart but about one and a half inches to the right, it was possible to hear both the systolic and the presystolic murmurs. To the right of the sternum, toward its lower end, was heard a murmur of systolic time and differing in its characteristics from that heard at the apex. There existed no visible pulsation in the veins of the neck, nor was it possible to detect hepatic pulsation.

At the aortic cartilage no murmur was heard save that supposed to have been transmitted from the apex, which, as the great vessels of the neck were approached, disappeared altogether. The pulmonary sounds were clear.

The clinical diagnosis was combined mitral stenosis and incompetency associated with tricuspid incompetency, the latter supposed to have been a relative defect depending upon primary mitral disease.

The specific gravity of the urine was 1017; its reaction acid; it contained no sugar; albumin, however, existed in large amount, but no casts were found.

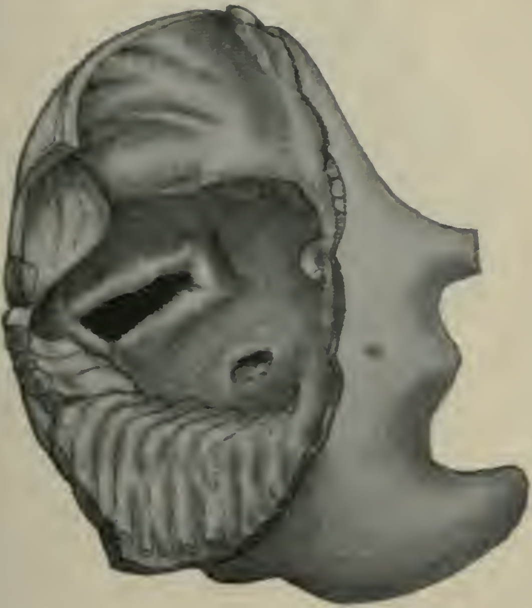
The patient's condition became so serious that he was unable to return to the hospital, and subsequent treatment was conducted at his home; nevertheless, his symptoms became progressively worse. Toward the end anasarca of the lower extremities became marked, and effusions took place into the abdominal, pleural, and pericardial cavities, while throughout both cyanosis and dyspnœa were extreme.

On July 28, 1894, the patient died.

The autopsy notes read as follows: The body that of a young man, about nineteen years of age. Post-mortem rigidity marked; slight discoloration of the dependent portions of the body; general anasarca, most marked in the lower extremities; abdomen distended; the skin generally extremely white and glistening, due to distention.

Thorax: Upon opening the thoracic cavity the lungs were hidden from view by a greatly distended pericardium. Both pleural cavities contained clear serous fluid; that of the left side three pints, that of the right side about two quarts.

FIG. 1.



Showing narrowing of the tricuspid orifice and intimate adhesion of the three cusps of the valve. Observed from the auricular aspect.

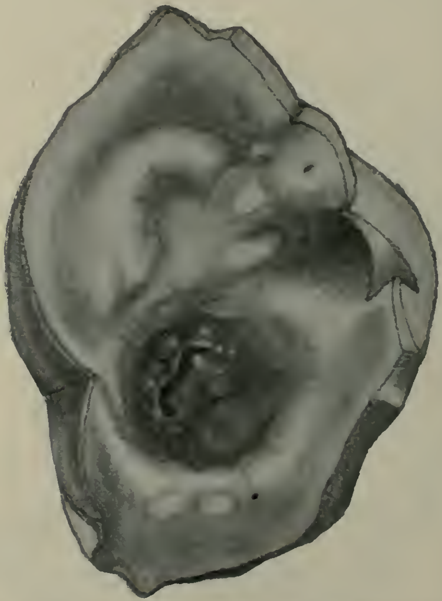
The lungs were partially collapsed and lying in the upper part of the thoracic cavity along the spinal column. The left lung showed considerable œdema and some hypostatic congestion at its base. The right lung was deeply congested, and at its base was a moderate sized area of consolidation, a piece taken from which sinking when placed in water. Neither lung showed any evidence of a recent or old tuberculous process.

The pericardium, upon being opened, was found to be filled with a blood-stained serum, the measured quantity being fifteen ounces. In several places the parietal layer appeared to be adherent to the right auricle.

The heart's right chambers were found to be distended with soft blood-clots, the left side being completely empty. The apex of the right ventricle extended about one inch below that of the left ventricle. Upon the external surface of the right auricle could be seen four small openings, each about 5 mm. in diameter, two being at the upper portion and two near the right auriculo-ventricular boundary. Corresponding points were noted upon the parietal pericardium, denoting that the latter at these places had been adherent to the auricular pericardium.

Upon opening the right auricle it was found to be filled with dark, soft clots; its cavity was much enlarged and its walls thickened. The auriculo-ventricular orifice was much narrowed and would permit the passage of the middle finger only with some difficulty. As observed from the auricular aspect the three cusps of the valve were found to be firmly adherent to each other and very much thickened, resulting in a stenosis of the tricuspid orifice of the button-hole variety. The valve, though thickened, was smooth and free from any calcareous deposits. The cavity of the right ventricle was much enlarged and its walls increased to about 1 cm. in thickness. The pulmonary valves were normal.

FIG. 2.

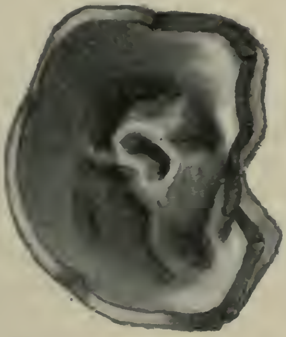


Showing narrowing of the mitral orifice; the light shading about the orifice and upon the auricular wall denoting calcareous plates. Observed from the auricular aspect.

The left auricle contained a small quantity of fluid blood, but was not distended. Through the auricle the mitral opening was found to consist of a mere slit, the edges of which were in firm and close approximation, so that even the tip of the little finger could not be inserted into the opening. The valvular ring upon its auricular surface was rough and hard, having many sharp calcareous projections which extended in several places upon the inner surface of the auricular wall. The slit constituting the mitral opening, being so short and the edges so firmly approximated, could have permitted but a very small quantity of blood to pass through.

The left ventricle was found completely empty; its cavity was greatly reduced in size, and its walls of great thickness. The aortic valve, by the water-test, showed no incompetency. The most extreme grade of aortic stenosis existed; the semilunar leaflets were firmly adherent to one another, resulting in the formation of a funnel-shaped deformity, the small end of which projected into the aorta some distance, and possessed an opening that would no more than admit the tip of a slate-pencil. The aortic orifice also showed some slight degree of atheroma.

FIG. 3.



Showing narrowing of the aortic orifice; the leaflets of the valve adherent together, resulting in a funnel-shaped projection, the narrow end of which points toward the aorta. Observed from the aortic aspect.

The abdomen was found to contain a large quantity of ascitic fluid. The intestines appeared to be normal. The other organs presented the conditions that might be expected to attend an advanced case of cardiac disease in which the right side of the heart had become involved. The liver was enlarged, congested, its lobules distinct, and its tissue upon section dense. The spleen also was enlarged and of increased firmness. The kidneys were somewhat increased in size and congested, the cortices being increased in width; their capsules stripped readily. The remaining abdominal organs were normal.

The accompanying illustrations, made by Dr. Stewart, well represent the various valvular lesions, and add materially to the value of the report.

Especially to Bedford Fenwick, and subsequently to Leudet, are we indebted for whatever of accuracy pertains to our present knowledge concerning tricuspid stenosis. In 1881, 1882, and 1883 Fenwick collected and analyzed before the London Pathological Society a series of seventy cases presenting this lesion, and in his Paris Thesis of 1888 Leudet has collected together, including the cases previously collated by Fenwick, one hundred and fourteen cases, with the results of the autopsies. The results of Leudet's observations as regards the influence of sex, age, antecedent causal history and the association, or non-association, of other valvular lesions, we have summarized as follows:

Sex.	No.	Age at death.	Previous history.	Associated lesions.
Female	86	2 from 60–64 years. 4 " 50–60 " 14 " 40–50 " 24 " 30–40 " 33 " 20–30 " 3 " 10–20 " 6 ages not mentioned	41 out of 60 cases had antecedent rheumatism; in 54 cases no history was mentioned.	Tricuspid and mitral . . . 78 " mitral, and aortic . . 21 " " and pulmonary 1 " and pulmonary . . 3 " alone 11 114
Male	22	2 from 60–64 years. 2 " 50–60 " 3 " 40–50 " 3 " 30–40 " 6 " 20–30 " 5 " 10–20 " 1 age not mentioned		
Not mentioned	6			

Since the publication of Leudet's Thesis we have found recorded in literature sixteen instances of tricuspid stenosis; but for three of these cases we have been unable to obtain more than the references. An analysis of the remaining thirteen cases and our own, however, offers some interesting comparisons with the results obtained from the above summary of Leudet's cases. Thus, we find these cases offer the following points:

Observer.	Sex.	Age.	Previous history.	Associated lesions.
Shattuck	F.	43	No rheumatism, but alcoholic.	Tricuspid, mitral, aortic, and pulmonary disease.
Chaplin	F.	18	No rheumatism, but scarlet fever.	Tricuspid and mitral stenosis.
Chaplin	F.	Not given.	Rheumatism.	Tricuspid and mitral stenosis.
Vaughan	F.	26	No rheumatism.	Tricuspid and mitral stenosis and aortic vegetations.
Vaughan	F.	50	No rheumatism.	Tricuspid and mitral stenosis and aortic vegetations.
Philip	M.	46	No rheumatism.	Simple tricuspid stenosis.
Gibson	F.	31	Rheumatism.	Tricuspid and mitral stenosis.
Gibson	F.	21	No rheumatism.	" " " "
Balfour	M.	14	" "	" " " "
Thacher.	F.	29	" "	Tricuspid, mitral, and aortic stenosis.
Grawitz	M.	24	Not mentioned.	" " " " "
Hay	F.	35	" "	" " " " "
Drummond . . .	F.	40	" "	" " " " "
Ashton and Stewart .	M.	19	Doubtful rheumat.	" " " " "

The above may be summarized as follows:

Sex.	No.	Age at death.	Previous history.	Associated lesions.
F.	10	2 from 41–50 years. 3 " 31–40 " 3 " 21–30 " 1 " 11–20 " 1 not mentioned.	Only 3 out of 11 cases had antecedent rheumatism; in 3 cases no history was mentioned.	Tricuspid and mitral . . . . . . 5 " mitral, and aortic . . . . 7 " " aortic, and pulmonary . 1 " alone 1 14
M.	4	46, 24, 19, 14 years.		

From these tables it will be at once noticed that the preponderance of tricuspid stenosis in the female is striking. Thus, in 108 of the 114 cases collected by Leudet in which the sex of the individual is mentioned, the lesion occurred in 86 females and only 22 males. Adding to these figures the 14 cases collected by ourselves, we find that 96 females were the victims of this lesion, and 26 males, a proportion in favor of the former of nearly 79 per cent. This difference in the liability of the sexes has been remarked by most observers, and Bedford Fenwick states its relative occurrence to be higher than even the above figures would show, claiming that it occurs seven or eight times more frequently in women than in men. The cause for the relatively greater predisposition of the female sex is held by Fenwick to be that the work of women is less laborious, and that in consequence the action of the heart is less powerful. As a result, back-pressure is slighter, and therefore the valve disturbance is less than in men. In men laborious occupations, greater compensatory hypertrophy, and more powerful cardiac action prevent the inflamed edges of the valves from adhering together.

If this explanation be the correct one, it would apply to the case which is the subject of this paper, inasmuch as this patient had always been averse to active exercise and had never followed any occupation entailing excessive exertion and, therefore, heart-strain. For these reasons the back-pressure may have been slight and the valve disturbance of only limited degree, thus permitting of the adhering together of the inflamed edges of the valves. This point if followed up might show that in the majority of the instances of the male sex presenting the lesion of tricuspid stenosis there exists a history of comparative freedom from much muscular strain, and that, therefore, they could in reality be classed with the female sex so far as their predisposition to tricuspid stenosis is concerned. If this should prove to be the fact, it would go far toward confirming the position assumed by Fenwick.

In reference to the age at which death occurs in individuals the subjects of tricuspid stenosis, Leudet states that the decade during which death takes places most frequently is between the ages of twenty and thirty years, and it will be noticed that the cases that we have collated confirm this statement. It will be seen, therefore, that the existence of tricuspid stenosis is unfavorable to a long life. Nevertheless, that it is not absolutely incompatible with a moderate degree of longevity is seen from the fact that in 33 of the 122 cases of which the ages are recorded, death did not happen until after the fortieth year. It cannot be controverted, however, that in tricuspid stenosis, as stated by Leudet in his conclusions, the prognosis is more fatal than in any other form of valvular defect. From the very nature of the affection this cannot but be the case, as with tricuspid stenosis there exists as a primary condition that which occurs only in the last stages of other valvular lesions;

namely, dilatation of the right auricle and consequent venous engorgement. Thus, from the onset in this disease there is a transference of the blood pressure from the arterial to the venous system, and with it engorgement and subsequent structural changes in the viscera.

From the evidence deduced by Leudet it will be seen that the origin of tricuspid stenosis may be either congenital or acquired. Fenwick, however, asserts that the disease is always acquired, probably never congenital, and that in half the cases there is an antecedent history of acute or subacute rheumatism. So, also, Sansom writes: "I consider that it is without doubt the result of an endocarditis of the rheumatic form, causing adhesion and thickening of the curtains of the tricuspid valve and adjacent structures; it may be initiated in intra-uterine life, but is more commonly a development of the endocarditis associated with rheumatism that affects the mitral valve concurrently." Leudet further concludes that tricuspid stenosis in the fœtus is more often due to malformation than to endocarditis, but when endocarditis does occur in intra-uterine life the tricuspid valve is more frequently attacked than the other valves, because during fœtal existence the greater amount of work is placed upon the tricuspid valve.

Whether acquired or congenital, however, there can be no question that the most frequent cause of tricuspid stenosis is an endocarditis of rheumatic origin. In Fenwick's statistics an antecedent history of rheumatism is found to exist in exactly 50 per cent. of the cases. This proportion is even higher in Leudet's cases, 41 out of 60 cases having had antecedent rheumatism, the previous history of the remaining 54 cases not being mentioned. At the lowest estimate, however, rheumatism existed as a morbid cause in over one-third of these cases, and it is fair to assume that in a large proportion of the cases in which the observers failed to mention the antecedent history, rheumatism probably played its usual part. In the 14 cases that we have collected rheumatism had occurred in but 3 of the 10 cases of which the previous history is recorded; and in our own case it is very doubtful whether the somewhat vague "rheumatic pains" from which the patient from time to time suffered could be ascribed to rheumatism. In this case, as will be observed in the clinical notes, no positive history of rheumatism could be obtained as having occurred either to himself or to any member of his family. He had been singularly free from infectious diseases, and but for the mild attack of measles from which he suffered when six years of age, and which is probably the least likely of all the acute affections to attack the endocardium, he presents a history of no disease that might be considered as having caused the extensive endocardial involvement. The possibility must not be overlooked, however, that the so-called rheumatic pains above referred to might in reality have been an evidence of rheumatic infection latent so far as the articular synovial membranes were concerned, but disastrous in its effects upon the endocardium.

The extraordinary latency in the symptoms of this case is remarkable and bears a striking resemblance to the case reported by Shattuck. The only possible cause in Shattuck's case was an attack of scarlet fever at eleven years of age, the patient not dying until the age of forty-three. Throughout this period a remarkable tolerance was exhibited to the extensive lesions that existed, and which, in reality, involved every valve in the heart; to the slow development and the gradual extension of these lesions Shattuck ascribes the tolerance acquired.

Although in our own case no positive evidence of cardiac disability occurred until six years prior to the patient's death, it is quite clear from his history that the endocarditis must have existed from a much earlier period. The very fact that from the patient's earliest childhood he had been indisposed to join in the amusements of his playmates, and had always been inclined to remain in quiet and retirement, is significant that there existed some ill-defined self-consciousness upon the part of the patient that he was incapacitated from taking part in the active exercises of others of his own age. When, however, upon being subjected, six years prior to his death, to an occupation not entailing any very laborious exertion, it at once became evident that a serious cardiac disability existed. In this connection it is interesting to call attention again to the fact that the patient presented himself for examination as an applicant for life insurance in March, 1894, and, as already stated, he believed himself to be at the time in good health, not suspecting the serious condition of his heart which the physical examination revealed. He next came under observation during the latter part of June, 1894, when he presented himself for treatment at the Jefferson Hospital. His symptoms then were those of ruptured compensation, and the physical examination revealed, in addition to the murmurs of mitral stenosis and mitral incompetency, a well-marked systolic murmur having its greatest intensity near to the sternal junction of the sixth right costal cartilage. The latter murmur was believed to be dependent upon a relative stretching of the tricuspid orifice, and was held to be secondary to the disease at the mitral orifice; the existence of tricuspid stenosis was not suspected.

A study of the various lesions found in association with tricuspid stenosis reveals the fact that mitral stenosis is the most frequently associated lesion, and occurs in the great majority of the cases. Both Fenwick and Sansom assert, however, that tricuspid stenosis is never met with except in association with mitral stenosis; and, indeed, in all of Fenwick's cases this lesion of the mitral orifice did in reality exist. Nevertheless, in Leudet's collection fourteen cases are cited in which no lesion of the mitral valve coexisted; in eleven of these the tricuspid valve alone was involved, and in three the tricuspid and pulmonary. So, also, in the fourteen cases that we have collected it will be seen that tricuspid stenosis unassociated with other lesions existed in one case. The above statistics of Leudet include the much-quoted instances of simple tricuspid stenosis reported by Duroziez and Torres Homem. The occurrence of tricuspid stenosis, however, not associated with mitral stenosis must be considered as a pathological curiosity. So striking is this fact that Leudet looks upon the disease at the mitral orifice as being the primary cause, in many instances, of the tricuspid lesion.

Aortic stenosis in association with tricuspid stenosis is stated by Sansom to occur in one-fourth of the cases. A study of the 128 cases shows that this lesion coexisted in twenty-nine of them, being a proportion of nearly 23 per cent., so that the statement of Sansom is about correct. It will further be noticed that no instance is noted in which the aortic disease is not also associated with mitral disease; in other words, tricuspid stenosis is never associated with aortic disease unless there also exists mitral stenosis, a point to which, I believe, attention has not until now been directed.

In such a case as the one the basis of this paper the question naturally arises, which valve system was the first to become diseased? From the drawings it will be noticed that the endocarditis is far more advanced in the left than in the right heart. Although this might be expected to be the case when we take into consideration the fact that the left heart is called upon to do the greater amount of work, and, therefore, would show the greater extent of lesion, a closer study of the lesions will show the existence of a simple adhesive endocarditis in the right heart, while in the left heart, especially upon the mitral valve and about the mitral orifice, even extending a considerable distance upon the inner wall of the auricle, will be seen numerous atheromatous and hard calcareous masses—a condition that is really remarkable considering the age of the patient. This is shown in the drawing illustrative of the mitral valve by the white shadings about the mitral orifice and upon the wall of the auricle. It seems to us, therefore, that the disease began first in the left heart, and that it later extended to the right heart, where it developed more gradually and insidiously as the result of the same cause which at first attacked the left heart, and which no doubt subsequently became repeatedly operative.

The high grade of aortic stenosis is well demonstrated by the drawing illustrating the condition of that valve. Notwithstanding this extreme stenosis its existence was not diagnosticated during life. This failure of diagnosis, as well as the absence of the radial pulse during life, require explanation. The cause of the latter phenomenon becomes evident if we reflect that because of the extreme mitral narrowing the quantity of blood passing into the left ventricle was necessarily very small, and that the obstruction offered to the passage of this small quantity of blood into the aorta by the greatly-narrowed aortic orifice was sufficient to obliterate completely the limited impulse that would have been imparted to the blood-column had aortic stenosis not existed. The same physical conditions, too, explain the failure to diagnosticate the existence of aortic stenosis; the small amount of blood in the left ventricle, and the difficulty with which it must have been forced through the narrowed aortic orifice, must have resulted in the production of a murmur possessed of such a low degree of intensity as not to admit of its perception.

In conclusion we will say that the diagnosis of tricuspid stenosis during life is rarely made, and in this connection the statement is made by Shattuck that in the eighty-nine cases upon which he bases his article, and which include the seventy cases brought forward by Fenwick, a diagnosis was made during life in less than half a dozen instances. This writer concludes that: " Whether a presystolic tricuspid souffle can be heard or not, tricuspid stenosis can be pretty safely diagnosticated if the patient is a female with rheumatic history, has mitral stenosis, perhaps also aortic disease, and presents the evidences of prolonged or recurrent venous stasis of greater or less degree."

The only particulars in which our case answered to this description were in the doubtful antecedent history of rheumatism and the existence of prolonged and marked cyanosis, a cyanosis which in its degree and persistency was remarkable; and in the light thrown upon the case by subsequent events we cannot but think that this symptom is of extreme significance as pointing to tricuspid stenosis, for in no other cardiac lesion is it found in so marked a degree, so prolonged in duration, and so uninfluenced by treatment.

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REVIEWS.

HISTO-PATHOLOGY OF THE DISEASES OF THE SKIN. By DR. P. G. UNNA, of Hamburg. ["Die Histopathologie der Hautkrankheiten," bearbeitet von Dr. P. G. Unna; mit 1 chromolithographirten Quartafel. Berlin, 1894, pp. 1225. Achte Lieferung der "Lehrbuch der Pathologischen Anatomie," von Dr. Johannes Orth.]

THIS comprehensive, elaborate, and scientific work is worthy of the distinguished German author who has labored so faithfully in the field of the pathology of the skin. It is a remarkable and very valuable production. To review the vast amount of matter that is contained in the volume is a task that is not possible to compass, but we shall endeavor to point out at least the scope of the work, and to enter into the spirit of the author in discussing it. One instinctively feels that the author is not a bookmaker, but that he writes because there is much information to impart.

Perhaps no better introduction to the book can be given than by presenting the outlines upon which the whole structure rests. The pathology of the skin is considered under the following headings:

I. Anomalies of circulation.
II. Inflammations.
III. Progressive disturbances of nutrition.
IV. Regressive disturbances of nutrition.
V. Malformations (misbildungen).
VI. Saprophytes and foreign bodies.

In the first class are grouped anæmias, hyperæmias, angioneuroses, œdemas, and hemorrhages.

In the second class are found traumatic, neurotic, and infectious inflammations.

Class III. Progressive disorders of nutrition, comprises carcinoma, adenoma, fibroma, angioma, and the like, together with certain hypertrophies.

Class IV. embraces degenerative changes, characterized for the most part by atrophies or loss of substance, as ulcers, due to varied causes, as scleroderma and similar diseases.

Class V., malformations, contains nævus and other congenital formations.

Class VI, saprophytes and foreign bodies, is small, including not more than a half dozen unimportant diseases, such, for example, as tinea versicolor, erythrasma and argyria. The subject-matter is hardly worthy of a separate class. In these six classes are embraced all the diseases which are known to involve the skin, by far the greater number being found in that convenient class, inflammations, so serviceable for clinicians as well as for pathologists. Here we note certain diseases which heretofore have by most authors been regarded as new growths, as, for example, syphilis, lupus vulgaris and lepra, as well as granuloma (mycosis) fungoides, which the author separates from sarcoma. But to point out the numerous changes which are made over formerly-accepted views as to classification and pathology would lead to a consideration of a large part of the book, so great is the revolution which on all sides confronts us. New terms (far too many, we do not hesitate to say) are conspicuous, some of which are tolerably familiar through work to be found in the special journals during the last decade, more especially by the author and his pupils; others are brand new. There is no occasion, it seems to us, for the coining of some of the new terms in this book, adjectives as well as substantives; for example, "spongoides" for spongelike.

The different diseases are taken up systematically, one after another, according to the classification, a brief clinical description often preceding the pathology, to which latter topic, it need scarcely be stated, all the matter is almost exclusively devoted. Authors and investigators are freely quoted, reference to the literature being given at the close of the chapter, from which lists one may get a good idea of the most important recent contributions to the subject considered. The author is a broad reader, and covers not only strictly dermatological matter, but also the literature of general pathology and bacteriology which may have a direct bearing on the point to be elucidated. This is as it should be, and shows the author to be not only a dermatologist, but also a general observer, who makes the whole field of medicine and surgery contribute to explain the simple and complex states of the skin in disease. This is surely the proper attitude from which to view dermatology. When so regarded the subject ceases to consist merely of a collection of primary and secondary lesions of the skin, to be viewed and located as such, as many authors would have us believe is the sum total of dermatology. The *meaning of these lesions*, after all, is the real substance of dermatology. The causes which produce them, and our ability to modify or remove them, are of much greater importance than their character, form, size, configuration, color, and the like. Symptomatology, *per se*, while of importance, must not be overestimated, for it is elementary and insignificant as compared with pathology. It is on a similar line of thought that Dr. Unna would interpret diseases of the skin in the work before us. Anatomy, pathological anatomy, and general pathology are made by him to throw light on the morbid conditions of the skin we are accustomed to regard as diseases. To say that he has done this in a scientific manner need hardly be stated, for all his work, now so well known to the profession through numerous and important contributions, bears this stamp.

The book contains a vast amount of original and valuable research, a good deal of which is on new lines of thought. Some of the views are distinctly in advance of general recognized knowledge. Whether they will be corroborated by future observers and eventually become established facts in dermatology is a question that time alone can decide. Thus, eczema is regarded as an infectious inflammation. Such a view, of course, is at variance with the teachings of other authors, and cannot be permitted to pass without challenge. Acute vesicular eczema is regarded as inoculable, and is spoken of as "impfeczem." So-called "morococci" or grouped mulberry-like cocci, as well as leucocytes, are described as occurring in the vesicles. In this connection the close relation of this form of eczema to impetigo, from a bacteriological standpoint, is dwelt upon.

Chronic eczema is discussed by itself and apart, special stress being laid upon the process of parakeratosis, the epithelial proliferation, and spongy ("spongoide") metamorphosis which takes place in the epithelium. Parakeratosis is the most important symptom of the disease, and is never wanting. It is pathognomonic. The seriously-infiltrated spongy state of the epithelium ("status spongoides" of the author) so common in eczema, especially in eczema rubrum, is described at length, being a very important element in the local pathology of the disease.

Eczema is regarded as the type of the "moist catarrhs" of the skin, and psoriasis as the type of the "dry catarrhs." Pemphigus is placed with the moist serous catarrhs, and not with the "neurotic inflammations," where it seems to us it would have been more properly grouped. To pass on to other chapters, we find lupus vulgaris, scrofuloderma, and tuberculous ulcers considered under tuberculosis, scrofuloderma being looked upon as a "secondary tuberculosis of the skin." This disposition of the scrofulous cutaneous lesions is reasonable.

The pathology of the cutaneous manifestations of the acute exanthemata have received careful study. The degenerative changes which take place in the pock of variola are clearly set forth and are illustrated in a plate. The so-called protozoa of the pock-pustule, as described by Pfeiffer and von Lœff, the author believes to be identical with his "ballonirten epithelien." One of the most interesting chapters is on carcinoma, which is dealt with in a most comprehensive manner from the histological standpoint, the varieties of the disease being made upon an anatomical basis.

The work throughout is so written, *currente calamo*, that it is difficult to bring out succinctly special points, or aphorisms, in connection with any particular disease. The style is quite the opposite to being aphoristic. Condensation of many of the chapters would not have detracted from the value of the matter. The aim of the author has been to describe accurately and closely what actually occurs in the skin and what he and others have observed in the various pathological processes considered. The studies are all recent. The work is fresh, and deals with the latest observations and discoveries. The book is not a text-book; it is, indeed, both in scope and in style, very far removed from and altogether above such works. It is an exhaustive exposition, from the histological standpoint, of the pathology of cutaneous medicine. It is a book to be studied rather than to be read casually. It deals with the subject from a strictly scientific aspect, touching practical matters only where science permits. The author fearlessly treads new ground, and upon which he feels himself secure, supported by the microscope and by abundant observation. One cannot help admiring the bold spirit which has prompted this champion of science for science's sake to venture far beyond the lines of general knowledge. New paths and fields have not only been staked out, but are occupied by him. How lasting this great structure, the labor doubtless of many years, that the author has raised will prove in the years to come no one to-day can foretell. In our opinion it may be safely stated the work has been done conscientiously, with the single aim of setting forth the results obtained by himself and other investigators in the same field. The details of the work done are immeasurable. An unknown territory in the pathology of the skin has been cultivated, and, moreover, upon such a comprehensive scale as to dwarf completely all other former attempts by authors in the same direction. Literature has been greatly enriched by the production of this work, which for many years to come will be regarded as authoritative on the histo-pathology of the skin. It stands alone; it is unique.

The chromo-lithographs are few and small, but they are accurate, each one showing clearly some interesting or undescribed point. There are no drawings or wood-cuts. We commend the book heartily to dermatologists, histologists, and pathologists,—to all investigators in special or general pathology, feeling assured that they will find a great deal of matter of intrinsic worth. A full index adds materially to the value of the work. The type and paper are exceptionally good.

L. A. D.

Obstetric Surgery. By Egbert H. Grandin, M.D., Obstetric Surgeon to the New York Maternity Hospital; Gynecologist to the French Hospital, etc., and George W. Jarman, M.D., Obstetric Surgeon to the New York Maternity Hospital; Gynecologist to the Cancer Hospital, etc. Pp. 207, with eighty-five illustrations in the text and fifteen photographic plates. Philadelphia: F. A. Davis Co., 1894.

This book not only fills a gap in obstetric literature, but also furnishes a strong plea for modern methods in treatment. The keynote of this volume is election in obstetric surgery; the writers maintain that the excellent results now secured in general surgery are obtainable in obstetrics, if the same principle of election which places the general surgeon at so great an advantage in dealing with many of his cases is adopted by the obstetrician. The book is entirely without padding, and impresses the reader as a candid statement of methods in actual practice with the writers.

An Introduction is appropriately devoted to obstetric asepsis and antisepsis. The writers consider that puerperal sepsis means faulty technique, and that there can be no shifting the responsibility on Nature. In treating of septic infection the writers employ the term "septicize," a word which is a stranger to us. In cleansing the hands the permanganate and oxalic acid method is preferred. In rendering the vagina aseptic the direction is given, and correctly, first to scrub the part thoroughly with soap and water before bichloride of mercury is to be used; although the best of reasons exist for this usage, it is doubtful if it obtains except with those best informed. A stronger solution of bichloride than 1 : 5000 is considered dangerous for douches. In rendering instruments and appliances aseptic the writers condemn strongly metal catheters, and urge that glass catheters and glass irrigating tubes only should be selected. The ideal suture for the ordinary purposes of obstetric surgery is silkworm-gut, which the writers rendered aseptic and pliable by boiling it for ten minutes in 5 per cent. creoline solution.

Pelvimetry is rightly the first procedure treated of in the book. The physician is held not guiltless who neglects pelvimetry, and it is urged that this may be practised while the surface of the patient's body is covered by a thin and pliable sheet. It is our invariable practice to examine patients in this way, and we have yet to meet with objection from an intelligent person to such an examination. It is urged that digital pelvimetry be practised as a routine measure in every case; we have not found this necessary, and reserve it for cases where an abnormality in the pelvic dimensions, revealed by the use of the pelvimeter, justifies a more radical procedure. The advice that digital examination of the pelvis should be made under anæsthesia in cases of pelvic abnormality is justifiable, as this is the only method affording practical information of value. The attention of the reader is properly drawn to the great importance of the comparative size of the child and pelvis. It is well said that if we could solve as approximately the size of the fœtus as we can the capacity of the pelvis, the surgical side of obstetrics would be much simplified. The general statement is made that if a fœtus can engage at the inlet, it can also engage at the outlet, of the pelvis, unless some abnormality be present, which may be determined by digital pelvimetry. In estimating which deformities of the pelvis are most often met with in the United States, the writers have found the major deformities but rarely, but call attention to the important fact that the determination of highly-deformed pelves is a far simpler matter than that of minor deviations from the normal. In highly-deformed pelves the choice of operative treatment is greatly restricted, while in the slightly deformed pelves a positive choice is often difficult. It is especially essential in the justo-minor pelvis to know the amount of diminution in its diameters, to elect a proper operative treatment. The various types of contracted pelves are clearly described, and the conclusion which the writers draw from this analysis is well urged, namely, the helplessness of the practitioner in the presence of a case of labor at term in an abnormal pelvis of whose shape and dimensions he is ignorant. He may be obliged to choose between the most difficult and unsatisfactory obstetric operations without the requisite time for proper preparation, and with his patient in a greatly-exhausted condition.

The description of artificial abortion is excellent, and great and proper stress is laid upon thorough asepsis and antisepsis in this procedure. We greatly prefer the douche-curette to the blunt loop figured in the book, and to the ovum-forceps. We are much averse to using a complicated intra-uterine catheter as difficult to clean as is the Fritsch-Bozeman. In our hands the douche-curette takes the place of the curette, ovum-forceps, and irrigating-tube described by the writers. The statement that the best of all instruments for removing the ovum is the aseptic finger represents undoubtedly the best judgment of the profession; but the aseptic finger fails in so many cases entirely to remove the ovum that the douche curette may be advantageously employed. Dilatation of the uterus by gauze packing well merits the full description given by the writers and the value which they place upon it as a method of treatment.

The induction of labor receives adequate attention, and we are glad to have the duty of the physician to examine his patient every week, by endeavoring to fit the fœtal head into the pelvis, so clearly and forcibly described. In describing the methods for the induction of labor, the writers lay proper stress upon preserving the membranes intact to protect the child. The value of the gauze strip as a vaginal tampon is well emphasized under this head. In inserting the bougie we have not found it necessary to employ the speculum, steel dilator, and tenaculum which the writers advise. By selecting a medium-sized bougie, and, under thorough antiseptic precautions, guiding it gently into the cervix, we have been able to introduce it with no other instruments than the fingers. Where the patient is nervous and frightened, partial anæsthesia with chloroform, or bromide of ethyl, has been necessary in our experience.

Rapid dilatation with the hand, the so-called *accouchement forcé*, has ardent champions in the writers of this book. We have no doubt of its value when performed with skill and patience; we should also add, under chloroform, and very possibly this anæsthetic would be preferred by the writers for such use, although it is not mentioned.

The incubator devised by Marx, of New York, does not impress us, from its illustrations, as being as inexpensive and portable as is stated by the book. We use a very simple incubator resembling that employed by Auvard, in which heat is supplied by cans filled with hot water. If one can be refilled at intervals of an hour and a half, a temperature of 86° or 88° F. is readily obtained.

In treating of forceps the teaching of the writers represents fairly the best usage of experienced obstetricians. There is no question that many things can be done with forceps, but it is also true that the legitimate range of this instrument is a strictly limited one, and that many forceps applications designed to produce rotation, or to expedite labor, may be well replaced by putting the patient in suitable postures, and by the practice of abdominal manipulation and administration of stimulants. The writers justly condemn any use of the forceps except as a simple tractor. They call proper attention to a safe rule for application when the conditions are favorable, namely, that whenever the head fails to recede after a contraction of the uterus, but remains stationary, the forceps should be applied. As we expected, especial stress is laid upon the folly of forceps application unless the practitioner knows the comparative size of the pelvis and the fœtus. In speaking of the dilatability of the *os uteri* we think that the authors are incorrectly stated by a misprint: on page 76 a statement is made that "Carcinoma of the cervix, inasmuch as the cervix is rendered so pliable, is a contra-indication of the application of forceps." In selecting the anæsthetic for the application of forceps our experience has not coincided with that of the writers, for we prefer ether to chloroform in most cases. Looking at the forceps as a supplement only to labor-pains, we select that anæsthetic which most tends to induce uterine contractions The importance of introducing, if necessary, the entire hand to make a positive diagnosis of the position of the head and to guide the forceps safely is well stated by the writers. The classification of applications made in this book into "low," "medium," and "high," is not borne out in our experience. If the pelvis and the fœtus are proportionate in size, we have been able to discover but two positions of the head in which the forceps is indicated: most frequently the head is found descended to very near, or upon, the pelvic floor, but without rotation; less commonly the head remains just within the brim of the pelvis or firmly engaged within the pelvic brim. When the head is movable above the pelvic brim the forceps is not indicated, in our experience, but symphysiotomy and the forceps, or version, should the form of pelvis be favorable, under chloroform anæsthesia, would be our choice.

The treatment of version in this book is excellent. Here again we call attention to the value of chloroform in contrast to ether in facilitating the operation. We are glad to note that the writers have found that, practically, that foot should be brought down first which can be soonest recognized and most firmly grasped. We have seen inexperienced operators considerably embarrassed and delayed while performing version by the effort to recall lecture-room directions as to the foot which should be brought down in a given case. The writers bring out very clearly a position which they have advocated for some time, namely, that in failure of rotation, the occiput presenting, but remaining persistently behind, it is often better to secure full dilatation of the cervix with the hand, and promptly to perform version. Our personal experience leads us to believe that this view is undoubtedly correct, and we wish that the excellent presentation of this point made in the book might be taught to every student of obstetrics before he attempts to deliver a case of posterior rotation of the occiput by forceps. As the writers state, their course of action herein advocated is not novel, nor is it as radical as at first sight it may appear. It has long been the custom in several of the Continental clinics to remedy defective rotation of the occiput by the introduction of the entire hand under chloroform anæsthesia, and even to terminate labor by version and extraction. The fact that thorough surgical antisepsis was tardily applied in American maternities and the prejudices existing in some quarters against the use of chloroform for version have done much to fortify the teaching that the forceps is the instrument to be used in these cases.

We have been much interested in the writers' presentation of symphysiotomy, and find that our experience coincides in the main with theirs. We have not observed, however, the bulging of the peritoneum and of the bladder into the opening at the joint, which is described by the writers. In performing the operation we have made it entirely a subcutaneous one, and with the exception of one case, which required the use of the saw, we have employed the Galbiati knife in its original form. The point made by the writers that the use of the Galbiati knife may do violence to the tissues about the urethra, favoring cystocele, we believe to be a good one. Cases under our observation, in which symphysiotomy was performed about a year ago, show perfectly satisfactory conditions so far as the pelvis is concerned. The only disability from which these patients complain is cystocele and retrocele of very moderate extent. As the patients are working-women who have been obliged to work hard from the time of leaving hospital care, it is quite possible that this complication would not have occurred had the patients not been obliged to undergo severe exertion. The stout, blunt-pointed bistoury, where its use is possible, certainly opens the joint with the least violence to the adjacent tissues. We desire to urge the importance of electing symphysiotomy, in place of performing the operation after a fruitless trial with the forceps. This view is in strict accord with that of the writers, but we should urge it more strongly even than do they. The results of symphysiotomy performed before the application of forcepe are so satisfactory for mother and child that we think this point worthy of emphasis.

In treating of Cæsarean section, the writers give an excellent presentation of the subject. They wisely lay stress upon the details of the operation, and anyone who has performed the operation will realize that if everything is properly done there is no smoother operation in surgery. We differ with the writers in advising the removal of the abdominal sutures on the tenth day; if silkworm-gut be used, the sutures are not irritating, and it occasionally happens that a patient recovering from Cæsarean section coughs or vomits, when a partial separation of the wound has occurred.

The writers carry the doctrine of election consistently through the book, and urge that embryotomy should be considered as indicated by due election. It is held that, in private practice, the question still remains open to the choice of the patient, while in maternity hospitals, in the hands of experts, the choice of the patient is less binding upon the operator. The prognosis of embryotomy is found to be more grave in private than in hospital practice. The reason for this is found in the fact that in private cases the attending physician will try every other expedient before having recourse to the destruction of the fœtus. Pelvic measurements are also less commonly taken among private cases, and thus the attendant is unwittingly brought into a position of great difficulty.

Under the head of the "Surgery of the Puerperium," immediate suture of the torn cervix is described, and the writers state that before long it will be recognized as desirable to close a torn cervix immediately after labor, as it now is to repair immediately a torn perineum. The description of immediate perineorrhaphy is excellent; the repair of fistulæ is also described, and rupture of the uterus receives adequate treatment.

In treating of obstetric surgery as applied to the management of sepsis, the writers properly begin by pointing out the fallacy of repeated intrauterine douching; they prefer, in cleansing the uterus, a sharp curette and irrigating with bichloride of mercury, 1 : 8000, followed by a pint of peroxide of hydrogen. We much prefer the blunt-edged douche-curette, using any one of the carbolic group of antiseptics. Our reasons for this choice are based upon the pathology of septic endometritis, it being our belief that the purpose of the curette and douche is simply to remove necrotic tissue, and not to invade the protecting area of granulation cells which hinder the access of septic matter to the blood and lymphatic circulation of the uterus. It is not our experience after curetting to observe that the patient has a chill, as described by the writers, and it occurs to us that possibly this chill is caused by fresh absorption of septic matter through channels opened by the curette.

We are heartily in accord with the teaching of the writers as regards the treatment of septic infection of the body of the uterus, the tubes and ovaries, and peritoneum. We have held for some time that unless marked improvement follow douching and curetting, with saline purgation, in forty-eight hours from the time in which the curetting is done, that the duty of the obstetrician is to perform cœliotomy, prepared to deal with whatever intra-abdominal complication may present. In dealing with ectopic gestation, we notice their reserve in stating that the arrest of the growth of the ovum by electricity is justifiable. No one can fail to agree with them in this, although they wisely abstain from stating their belief that the growth of the ovum *can* be checked by electricity. We are quite sure that, in their hands, no time would be wasted with trials of electricity. In dealing with abdominal gestation the writers express a very gloomy view of the chances for delivering a living child by cœliotomy. The records of operation for this condition, it seems to us, afford ground for a more hopeful view in the interests of the child, and we fail to understand why incision and removal of the child and leaving the placenta is any more dangerous than incision and removal of a dead child, the placenta remaining to be discharged piecemeal in each case. The dangers of delay to await the death of the child are considerable, and from our knowledge of such cases we should much prefer to operate with the endeavor of securing a living child.

In concluding our review of this book we feel that the writers have placed us under obligation for presenting in clear and forcible language an accurate statement of personal experience. They establish what we take to be their point, namely, that the honest practice of obstetrics requires surgical skill and the same study and care which the successful surgeon gives to other patients; that anything less than this is justifiable obstetric practice the writers do not believe. The influence of this book should be for good, in counteracting a vicious opinion in the minds of the profession and laity, namely, that because labor in a physiologically perfect mother and fœtus, under physiologically perfect conditions, is a physiological process, that therefore labor, as observed in all classes of patients, is a physiological process. This error, an inheritance from the era of obstetric teaching which denied the contagious nature of puerperal fever, has resulted in cheapening obstetrics as a branch of medicine, by assigning labor cases to midwives and students, and by educating the laity to believe that partially educated medical persons are competent to deal with labor cases. While we differ with the experience of the writers of this book in some respects, we have nothing but commendation for their valuable contribution to obstetric literature. It has given us profit to learn from them, and it will be our pleasure to place their book in the hands of others. E. P. D.

NEW YORK EYE AND EAR INFIRMARY REPORTS. Vol. I., Part I., January, 1893; Vol. II., Part I., January, 1894. Edited by JOHN E. WEEKS, M.D., Pathologist to the Infirmary. Large 8vos., pp. 111 and 104. New York: G. P. Putnam's Sons.

OPHTHALMIC medicine is to be congratulated upon the appearance in conjoined form of the most important of the great and valuable work of this well-known institution. This, the first attempt of its kind in this part of the world, has been most successful. The first volume opens with a report by Dr. Callan upon the clinical histories of nine cases of orbital traumatism resulting in immediate monocular blindness through fracture into the foramen opticum. He states that immediately after the accident the patient is either stunned or becomes dizzy, and may suffer from shock. There is bleeding from the nostrils, the mouth, and the ears. In a little while, the patient discovers that one eye is blind. Examination shows palpebral œdema, followed in a few days by discoloration of the lids. The eye itself is generally diverged and protruded. The conjunctiva is ecchymosed. The pupil is large and the iris remains irresponsive to light stimulus. At first the ophthalmoscopic appearances are negative, but within two weeks the utmost pallor of the optic disk becomes noticeable.

The writer's explanation of the reason why such fracture involves the optic foramen is as follows: As the frontal bone unites with the nasal, superior maxillary, lachrymal, and ethmoid bones by a continuous line of sutures until the lesser wing of the sphenoid bone is reached, and as at this point the suture line bifurcates, forming an obtuse angle, and as the optic foramen is quite near the apex of this angle, the jar made by a blow would find its weak point along this line of sutures, and the first resistance would be at the bifurcation that is adjacent to the optic foramen. Consequently, as the movement or jar could not follow both lines with equal force at and beyond the bifurcation, the unequal strain would result in fracture of the bone into the optic foramen, producing compression of the optic nerve and sudden loss of vision in the eye.

Gruening follows by a careful clinical history of a case of affection of the cervical sympathetic nerve with oculo-pupillary symptoms and anidrosis, in which, as in Nieden's classical case, the pathological paradox of the coexistence of paralysis and irritation in one and the same nerve presents itself. He does not offer any new light upon the obscure pathology of the sympathetic by his contribution, but believes that the salient point is, that simple exposure to changes of temperature may produce a permanent affection of the cervical sympathetic in which the vascular symptoms in the onset are those of constriction and not of dilatation. In this case, as in Niedin's, there was no alteration in the accommodative function.

Based upon a successful operation by means of Wolfe's flaps for the restoration of the integument of the eyelids in a case of severe burn, and a critical study of thirty-seven cases where the same procedure was employed, the editor arrives at the following important conclusions:

1. The transplantation of a flap without a pedicle is not so certain to be successful as the transplantation of a flap with a pedicle. The former should be done only when the latter is not possible.
2. The flap should be free from subcutaneous tissue, and should be kept at the temperature of the body as nearly as possible during the process of removal. It should be placed in position as quickly as possible.
3. Strict antisepsis or asepsis should be employed throughout the entire procedure.
4. No sutures should be employed for securing the flap if they can be dispensed with. They add an element of danger.
5. The flap may be inspected with safety after forty-eight hours. If there is no contra-indication, it should not be disturbed for four or five days.
6. The attachments to the cheek or of the margins of the lids to each other should not be severed until the flap has become firm.

In a practical paper upon "Operative Measures for the Relief of Chronic Suppurative and Non-suppurative Inflammation of the Tympanum; the Indications for the Employment of Such Measures and the Results Obtained," Dench comes to the conclusion that there can be no question that surgical procedures upon the middle ear enable us to benefit a large number of patients who would otherwise be unrelieved. He believes that operative interference in this region must take the same position as in any other; and thinks that it must not be adopted to the exclusion of all other plans of treatment, nor must it be resorted to in every case in which milder methods have failed to afford relief. He says that care in the selection of cases, restricting surgical procedures to those only in which a thorough study by all means in our power indicates that operative treatment will be beneficial, cannot fail to give operative otology a prominent place in the special surgery of to-day.

Other papers and communications of very great interest have been written by Adams, Alderton, Bacon, Cocks, Dench, Essen, Hewitt, Mayer, Skeel, and Weeks.

Upon careful reading, the second volume proves itself even of greater interest than the first. Noyes gives some very important clinical contributions upon a series of plastic operations on the skin which were made for the correction of various deformities. He also puts on record a case of capsular cataract and foreign body in the retina for sixteen years, which is remarkable in the fact that calcareous degeneration of the lens and the presence of a foreign body upon the retina were not sufficient causes for irritation, while the calcareous fragments of the lens floating in the vitreous, impinging upon the interior of the eye, were amply sufficient to create serious disturbance. A brief recital of a case of spontaneous disappearance of cataractous opacity, and the notes of a temporary attack of keratitis following the extraction of a hypermature cataract are also given by the same author. The last case is noteworthy in the fact that immediately following the delivery of the lens a four per cent. solution of boric acid was unintentionally injected into the anterior chamber of the eye; this, according to the author, being the cause of the production of the corneal reaction. He strongly urges that we should not use irrigating fluids stronger than one per cent. of boric acid, or, still better, the $\frac{7}{10}$ per cent. solution of chloride of sodium, the fluid being blood-warm and sterilized.

Derby's cases of affection of the eye, apparently dependent upon uterine derangement, are given in the highly commendatory spirit to stimulate others, either in gynecological or ophthalmic practice, to make public their observation in this direction. His clinical history, with the microscopical study by Weeks, of a case of cylindroma of the face, is of great interest.

Papers by Friedenberg, upon the pathology of sarcoma of the choroid; by Asch, upon endothelium of the tonsil; by Dench, upon affections of the sound-perceiving apparatus; by Weeks, upon a most interesting case of sympathetic ophthalmia occurring forty-two years after the loss of the exciting eye, followed by recovery, with useful vision, are all very important, and show how varied the work has been.

Valuable contributions by Callan, Dennett, Skeel, Lambert, Marple, Bacon, Roberts, and Noyes upon various affections connected with the eye, throat, nose, and ear, and the description of useful and improved modifications of different apparatuses, with a summary of the year's work done at the Infirmary, conclude the second volume.

Such work as this, brought together in its present collective form, offers both the general reader and the scientific expert an opportunity of seeing this representative work of the members of the staff of the Infirmary in a combined manner, instead of compelling the reader either to search haphazardly in a desultory way through various, and in many cases only locally-known, medical journals. Moreover, as shown by the results of the same character of publications in both the general and special hospitals of the old world, the staff both individually and as a unit become better known, and the Institution is able to show more plainly the real amount of work done within its walls. We earnestly hope that these two volumes may be the beginning of a long series of constantly bettering and increasingly valuable reports. C. A. O.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, A.M., M.D., LL.D.,

PROFESSOR OF CLINICAL MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; VISITING PHYSICIAN TO ST. MARK'S HOSPITAL.

THE TREATMENT OF EMPYEMA IN TUBERCULOUS PATIENTS.

DR. CH. BÄUMLER concludes a very interesting clinical study with the following statements: 1. Under all conditions a radical operation should be done—the best is a thoracotomy with resection of ribs—if the exploratory puncture shows the presence of the bacteria of suppuration in the exudation. 2. If the exudation contains no bacteria of suppuration, but perhaps few tubercle bacilli, or indeed no bacteria of any kind, aspiration may be employed, which will relieve pressure, and will allow the lung to expand if it be expansible. 3. If the case is one of long standing, the compressed lung inexpansible, the condition of the patient passable or good, the empyema stationary, palliative measures are more in the interest of the patient. Of these measures the Playfair-Bülau method of slow aspiration-drainage is the least severe.—*Deutsche medicinische Wochenschrift*, 1894, Nos. 37, S. 717; 38, S. 738.

HOW TO TREAT A DIABETIC ATTACKED WITH ALBUMINURIA.

DR. HENRI HUCHARD divides this subject into three parts: 1. If there is an albuminuria of nervous or dyscrasic origin, not dependent upon any renal lesion, which is slight, transitory, alterative or substitutive, associated most frequently with slight diabetes, this is a hybrid condition, a glyco albuminuria. It is quite likely to be of dyscrasic origin, produced by a functional trouble having its principal seat at the floor of the fourth ventricle. The indications are the nervines (bromide, zinc phosphide, antipyrin), revulsives to the neck, or methyl-chloride. As for the albuminuria, it is to be ignored. 2. If the albuminuria is of renal origin, it is a parenchymatous nephritis and consecutive to the diabetes, and there are two diseases developing side by side. In most cases it is the renal disease which is threatening, and it is necessary to make use of a milk diet. Here, as in all renal disease, it is necessary to consider the heart, and large doses of digitalis may be needed. 3. Diabetics often suffer from arterio-sclerosis, and under this head can be placed interstitial nephritis, better called arterial nephritis. Here again the danger lies in the kidney, and it is the heart which must be sustained and fortified at a given moment. In this case do not hesitate to prescribe a milk diet, and later digitalis; voyages, and especially long railway journeys, should be forbidden. For the cases in which albuminuria complicates diabetes the patient should visit Vichy or Carlsbad; but these waters are absolutely contra-indicated when the diabetes is complicated by an interstitial or by a parenchymatous nephritis. Here the diuretic waters, Contréxeville, Vittel, or, better, Evian, should be used. But the benefit which the patients may derive does not always compensate for the dangers to which they are always exposed upon the long railway journeys.—*Journal des Practiciens*, 1894, 2e. sémestre, No. 33, p. 386.

ERGOTISM.

DR. P. CHATIN reports a single case in which the phenomena of ergotism were consecutive to the hypodermatic use of ergotin in the treatment of a uterine fibroma which was cured. The daily amount of ergotine of Lamonte which corresponded to fifteen grains of ergot was used. The symptoms were cramps in limbs, especially at night, permanent numbness in the extremities of the fingers, which was painful and accompanied by painful tinglings, the face and extremities were congested, but of a livid tint. There was also an active sense of præcordial anguish, and a retro-sternal pain extending to the left shoulder and along the left arm to the hand; the heart-beats were regular, the impulse strong, the pulse presented a distinct tension. Some of these symptoms may have been due to the mitral stenosis from which the patient suffered, and to the dry pericarditis which co-existed in this case. Six months later the tumor was only found with difficulty, and the phenomena of ergotism had not left even a trace.—*Bulletin Gênêral de Thêrapeutique*, 1894, 40e. liv. p. 360.

BORISM.

DR. CH. FÉRÉ presents an interesting study of the accidents which may occur during treatment by borax. During the six years of experiment, commencing with a daily dose of forty-five grains and increasing it until five drachms are administered, it has been determined that in a considerable number of individuals the tolerance is very great. Gowers has noted diarrhœa, nausea, and vomiting excited by small doses; eruptions of psoriasis may be produced. Eczema has not been observed with the small doses of forty-five grains. The gastric symptoms may be so severe that an actual intolerance results. Sometimes they may be suppressed by the administration of the remedy in glycerin, or by the use of intestinal antiseptics, which also have the advantage of acting upon the cutaneous eruptions. The drug causes a dryness of the skin and mucous membranes, a dryness and a falling out of the hair, the nails present striations. Of the especial forms of eruption, a seborrhœaic eczema of considerable variety, or an acne, or an eruption resembling measles or scarlatina, or a papular one, more or less itching, is common. The boric cachexia is often seen as a waxy tint of the complexion, with discoloration of the mucous membranes. Furuncular eruptions are often noticed. Besides these manifestations others of more serious import are observed. Œdema of the eyelids, of the face, and of the extremities is noticed, and albumin is found in the urine. Borism gives rise to accidents which are quite as grave as those of bromism, with the difference that those arising in the kidneys are more insidious and more difficult to remove. The inefficacy of the suppression of the drug for the relief of these conditions is explained by the slowness of its elimination. When the fact is taken into consideration that marked success as the result of its administration is exceptional, and when it is useful it produces hardly more than temporary alleviation, and when, as has been shown above, it may produce not only inconvenient but also grave and even fatal accidents, there seems to be but little reason for its employment in epilepsy.—*La Semaine Médicale*, 1894, No. 62, p. 497.

POISONING BY EXALGINE.

M. **WEBER** reports an instance where half an ounce of this remedy in three ounces of water had been swallowed. One and one-quarter hours after there were restlessness, rotatory vertigo, blunted sensibility, contractures, and threatening asphyxia. Then followed convulsive crises with cyanosis. Anuria persisted for twenty-four hours, then emission of urine containing hæmatin, biliary pigment, and albumin. Improvement commenced, but there were observed slight delirium and anorexia, with slight jaundice and subconjunctival ecchymosis. The treatment consisted of injections of caffeine, electrization of the phrenic, administration of an emeto-cathartic, and bloodletting.—*Journal des Practiciens*, 1894, 2e. sémestre, No. 34, p. 416.

A NEW TREATMENT FOR TUBERCULOSIS.

DR. A. MAYOR reviews the work of Viqueret. Recognizing the fact that the ass, as well as the mule, has been demonstrated by Chaveau to be completely refractory to tuberculosis, the serum obtained forty-five days after an intravenous injection of bacilli is made use of. This intravenous injection in the ass, it is true, gives rise to a miliary tuberculosis, but caseation does not result, and the animal recovers, the only abnormal manifestation being the development of an extraordinary appetite. Thus far the serum is useful only against tuberculous infection, and not against the microbes of suppuration. It is hoped, however, during the coming year, to obtain such a serum, and with an injection of the confined serums tuberculosis with suppuration may be successfully treated.—*La Médecine Maserve*, 1894, No. 84, p. 1301.

THE TREATMENT OF DIPHTHERIA BY ANTITOXIN.

DR. CHARON reports thirteen cases, nine treated by Roux's, the remainder by Behring's antitoxin. Of these cases four died (two after tracheotomy), and of the nine cases which recovered, seven underwent the operation of tracheotomy. The temperature charts show a striking resemblance; in almost all cases the defervescence was by lysis. In case of the complication of broncho-pneumonia the type of descending oscillations was interrupted by a rapid rise, even to 104° F. In all cases excepting two the Loeffler bacillus was found, the failures being undoubtedly due to faulty inoculation. In these cases the injections appeared to be absolutely harmless when thorough antiseptic precautions have been observed. In the cases where tracheotomy was performed it was possible to remove the canula on the third or fourth day, the false membranes in the pharynx disappearing more rapidly than those in the larynx and trachea; the tracheal wound is not complicated by diphtheria, but it is covered in about eight days with a dry scab, under which the skin is restored. A fact which should be borne in mind with reference to the cases which need operative interference is that the rapid breaking up of the membranes is accompanied by an abundance of purulent mucus, which would be more readily expelled through the tracheotomy canula-tube than through the O'Dwyer tube. Since the broncho-pneumonia is the most frequent fatal complication the older forms of treatment cannot be abandoned. This requires tonics, alcohol, antipyretics, a moist, warm, and microbicidal atmosphere, because the antitoxin acts only against the toxin secreted by the Loeffler bacillus, and not against that of the streptococci and staphylococci associated with it.—*Journal de Médecine, de Chirurgie et de Pharmacologie*, 1894, Fasc. 4, p. 337.

Dr. A. McGregor reports a single case of diphtheria complicating measles. A woman, of twenty-five years of age, seven days after the appearance of a copious rash of measles complained of sore-throat and headache. On the right tonsil was seen a small yellowish-gray patch, with a few smaller spots palate and to the opposite tonsil, and glandular swelling appeared in the neck. about it. During the two days following, the patch extended to the soft Microscopic examination and a cultivation proved the case to be one of true diphtheria. Sixteen minims of antitoxin were injected into the muscles of the back. During the next five days improvement continued, and convalescence was established.—*Lancet*, 1894, No. 3717, p. 1215.

Tetanus Treated by Tizzoni's Antitoxin.

Dr. B. Bauer reports a fatal case which was seen eight days after the injury, and which was two days under observation. The symptoms of tetanus did not appear until the day before the treatment was commenced. Besides the antitoxin, the patient received sixty grains of chloral. In the cases previously reported the chronicity of the disease was marked, while in this the short period of incubation and the rapid progress of the symptoms are in contrast. Whether the former series of cases would have recovered under treatment by the usual narcotics is an open question.—*Wiener klinische Wochenschrift*, 1894, No. 45, S. 846.

The Treatment of Severe Stridulous Laryngitis in Infants.

Dr. Henri Huchard states that this condition is based upon two elements, an inflammation and a spasm of the larynx. It is not the inflammation, which can be slight or intense without increasing the gravity of the case, but it is the spasm which constitutes the danger. The emetics, compresses of very hot water (Graves), sinapisms to the lower limbs, internal administration of ether, are all untrustworthy and inefficient. The remedy is potassium bromide, which must be used in large doses (for a child of four and one half years, sixty to seventy grains per day). The surgical treatment is either intubation or tracheotomy.—*Journal des Practiciens*, 1894, 2d *Semestre*, No. 38, p. 465.

THE HYDROPATHIC TREATMENT OF PNEUMONIA.

DR. RENDU reports two successful cases. In the first he prescribed the wet sheet and kermes mineral (sulphurated antimony) in julep. The diagnosis was a lobar broncho-pneumonia of irregular evolution, suggesting the grippal variety. Every two or three days there were recrudescences of a type analogous to that of intermittent fever. Each time that the wet sheet was applied there was relief. Although this procedure did not modify either the evolution of the disease nor jugulate it, it certainly contributed to the cure by diminishing the dyspnœa and hyperpyrexia, and by relieving the functional troubles of the kidney. In the second case, alcohol with tincture of digitalis was used. The wet sheet was ordered, and upon the following day, since all symptoms were aggravated and delirium was marked, three cold baths were administered, and upon the next day two baths were given. In pneumonia, cold baths constitute a therapeutic measure of the first order, truly heroic. Their use is, in reality, a return to the first ages of medicine, for Hippocrates has shown their good effects in pneumonia, and has established the fact that they diminish the stitch-pains in the side, facilitate expectoration, and are diuretic.—*Journal des Practiciens*, 1894, 2d *Semestre*, No. 37, p. 449.

THE TREATMENT OF PYREXIA.

DR. W. HALE WHITE believes that hyperpyrexia should be energetically treated by cold baths. In ordinary pyrexia the routine use of antipyretics is not good practice. When benefit coincides with the reduction of temperature the means employed have a specific beneficial effect upon the particular disease; consequently the temperature falls at the same time as the other symptoms improve. In this sense mercury, in syphilitic fever, is antipyretic. Antipyrin, acetanilid, and phenacetin should rarely be used as antipyretics.

DR. JAMES A. LINDSAY stated that external cold was the only efficacious agent in hyperpyrexia, either as cold bath or as cold infusion. In typhoid fever he had found no permanent benefit from the use of antipyrin, acetanilid, or phenacetin. An occasional large dose of quinine (twenty or more grains) given six or eight hours before the upward rise, was often beneficial. The treatment of phthisical pyrexia was very discouraging; the slighter degrees were often here left alone or treated by dieting, fresh air, and rest; the severer degrees were often uncontrollable.

DR. JAMES BARR finds that an enormous amount of latent heat can be insensibly removed from the body through the exhalation of watery vapor. A properly made and properly applied warm flaxseed poultice becomes a valuable antipyretic measure. It should be free from oil, very moist, and allowed to evaporate freely from its external surface. In this way it tends to cool rapidly, as it quickly absorbs heat which is brought to the surface through the dilated capillaries, and insensibly transferred to the atmosphere in vapor. Heat can also be abstracted from the body by radiation. Some tins made with parallel surfaces in segments of a circle, filled with ice and then stoppered, were placed about the patient so that he was almost completely surrounded, although he did not come in contact with them. As radiant heat does not affect the media through which it travels, the patient was not rendered very uncomfortable so long as the air was kept still. Water is the great physical agent for reducing temperature. In moderately severe cases cold compresses or wet packs may be sufficient. In hyperpyrexia cold baths or cold douches not merely abstract heat, but rouse up the nervous system. The effect of the application depends not so much upon the temperature of the water as upon the suddenness and momentariness of the application. These cases are best treated by playing upon them with water out of a hose pipe. In other severe cases of pyrexia with prolonged high temperature, and especially in cases of typhoid fever, constant immersions in water at a temperature varying from 90° to 98° F. are satisfactory.

DR. R. DOUGLAS POWELL states that many remedies of the thermolytic class—antipyrin, phenacetin—while valuable in reducing excessive temperature, require careful handling, for if the temperature be reduced considerably below that normal to the disease the danger of relapse of microbic activity is greatly increased. Remedies of the quinine and salicin class, on the other hand, were antipyretics by being germicides and antitoxins. These two remedies were often advantageously combined.

DR. R. SHINGLETON SMITH admits the utility and safety of the bath, but the introduction of modern antipyretic drugs has removed the necessity of adopting the cold-bath method in all cases of typhoid and other fevers. He had never seen any harm from the efficient, but not excessive, use of phenacetin, and at this time he rarely found it necessary to adopt the cold-bath method, because the temperature was controlled by simpler and less disagreeable methods.

DR. E. MARKHAM SKERRITT believes that quinine is still one of the best and safest of antipyretics, when given in doses, for an adult, of from thirty to forty grains, either in one or in two doses at a half-hour interval.

DR. THOMAS GRAINGER STEWART did not adopt the cold-bath method as an habitual practice, but trusted rather to cold sponging, iced cloths to the abdomen, and the continuous use of antipyretics, reserving cold bathing only when remedies of easier application failed.

DR. HERBERT SNOW called attention to the antipyretic virtues of calomel, purifying the *primæ viæ* and being partly converted into corrosive mercuric chloride, so hostile to microbes.—*British Medical Journal*, 1894, No. 1768, p. 1093.

THE TREATMENT OF PURULENT PLEURISY.

DR. C. G. CUMSTON believes that in recent favorable cases, devoid of all complications, all methods such as aspiration, incision, or resection, may bring about a cure. For cases which are incurable by the so-called classical methods, the siphon of Revilliod offers the prospect of cure. The siphon consists of a tube of black rubber, which is inserted into the pleural cavity;

two feet from the proximal end is placed a bulb, and distally, the tube, being continued for three feet, its termination is placed in a receptacle containing an antiseptic solution—either carbolic acid or creolin—so as to prevent the entrance of air. The proximal end is retained in position with plaster. If there is no fistula, an incision is made near the posterior axillary line, that is, near the anterior border of the great dorsal muscle, whose fibres can be cut without inconvenience in the seventh or eighth intercostal space on the right, and in the eighth or ninth intercostal space on the left side. The advantages of this method are that there is no immobilization of the lung with retention of gas and liquid, but immediate expansion, and the washing out of the cavity is less necessary. In a word, the siphon cures without resection of the ribs and without fistula. Six cases are reported of either chronic or complicated pleurises which would have been considered as incurable, all of which ended in recovery.—*Boston Medical and Surgical Journal*, 1894, vol. cxxxi., p. 502.

THE TREATMENT OF CHRONIC HEART DISEASE.

DR. ROBERT H. BABCOCK reports nineteen cases which were treated by the Schott method of baths of from 93° to 87° F., containing free carbon dioxide and the salts of sodium and calcium chloride, and by gymnastics. There is no doubt that this method may be dangerous in degenerative changes of the bloodvessels and of the myocardium, such as aneurism and advanced arterio-sclerosis, acute softening, and great fatty degeneration of the heart, when rupture may result from heightened intra-vascular and intra-cardiac pressure. Chronic interstitial nephritis is not a contra-indication. In hypertrophied hearts the baths should not be given as long as the heart is adequate to the peripheral resistance to be overcome, but only when the cardiac energy is threatening to fail or has actually failed. The gymnastic exercises (movements of flexion, extension, and rotation of the extremities and trunk, performed slowly and steadily, interrupted by periods of repose, and against the counter-resistance of a trained attendant) are an important adjunct to the baths. The effort exerted by the patient is not so great as to cause embarrassment of respiration, or undue acceleration of the pulse. If the exercises are properly performed, and the resistance judiciously apportioned to the patient's endurance, these gymnastics slow the rate and augment the force and volume of the pulse, as has been repeatedly shown by the sphygmograph and sphygmomanometer. If too great resistance be applied, there is produced a sensation of cardiac distention with variable degree of dyspnœa, while the pulse grows more rapid and feeble. Improved arterial circulation is so manifest a result of these exercises that it has been known to lessen the frequency and even the severity of the attacks of angina pectoris in individuals who, on account of arterio-sclerosis, had been unable to indulge in even very moderate physical exercise.—*New York Medical Journal*, 1894, No. 836, p. 705.

THE RESUSCITATION OF STILLBORN INFANTS.

DR. BEDFORD BROWN, during the past three or four years, in several cases of this kind, apparently under the most hopeless circumstances, when all other standard methods had failed, has resorted to hypodermatic injections of brandy or whisky with the most satisfactory results. The amount used is five or six drops in first one arm and then in the other, fifteen drops being the largest quantity used in a single case. If the mother has suffered alarming ante-partum hemorrhage, and the infant has been drained of blood before its birth, this method can avail nothing.—*Therapeutic Gazette*, 1894, No. 11, p. 730.

THE TREATMENT OF TUBERCULOUS MENINGITIS.

DR. R. HIRSCHBERG reports a single case which was successfully treated by trephining and drainage of the sub-arachnoid space. The effect of the operation was remarkable, the headache ceased, the pulse became more rapid, the commencing coma disappeared, as well as the vomiting.—*Bulletin Général de Thérapeutique*, 1894, 42d liv., p. 411.

THE TREATMENT OF DIABETES MELLITUS.

DR. ARTHUR CLARENCE JACOBSON states that codeine and arsenic have long been the sheet-anchors in this disease. The former should be boldly pushed—one to five grains three times daily, which apparently exercises an influence over the central nerve-changes, thus being curative as well as palliative, but is to be avoided in those cases which are controllable by diet. It may check the waste. Arsenic is used as Clemen's solution of bromine arsenite, in doses of four drops three times daily. In the case reported no results were obtained from these drugs. He does not believe that arsenic exercises any influence over the disease, but that it is useful as an adjuvant tonic. Carbolic acid is an effective antidote to the troublesome itching of the skin. The excessive thirst may be allayed by the use of acidulated or alkaline waters.—*Brooklyn Medical Journal*, 1894, No. 12, p. 735.

THE TREATMENT OF GONORRHŒA.

DR. H. M. CHRISTIAN has used corrosive mercuric chloride, silver nitrate, potassium permanganate, and trikresol for daily irrigation of the urethra. The amount of warm, not hot, liquid used was one quart, the reservoir being at a height of six feet, the patient standing. The duration of the treatment was two, exceptionally three weeks. He concludes: 1. That irrigation is a distinct advance in treatment; to a certain point it must be considered the proper treatment. It relieves *ardor urinæ* and chordee more promptly, and is attended with a much smaller proportion of complications, as total urethritis and epididymitis. 2. That potassium permanganate, in proportion of 1:4000, increasing in the second week to double this strength, is the best remedy. 3. That irrigation of the urethra alone cannot be relied upon absolutely to cure specific urethritis. For the cure of the thin muco-purulent discharge which appears at the meatus in the morning some astringent injection is necessary. 4. That simple non-infectious urethritis can be cured in from ten to twelve days by daily irrigations with potassium permanganate.—*Therapeutic Gazette*, 1894, No. 11, p. 723.

MEDICINE.

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THE RÔLE OF STAPHYLOCOCCI IN THE ETIOLOGY OF ACUTE ARTICULAR RHEUMATISM.

SACAZE (*Archives Gênérales de Médecine*, November, 1894, p. 513) contends that it is often possible in the course of acute articular rheumatism to discover an infective lesion that has preceded for some time the appearance of the pain and other articular manifestations. Such a lesion may be conceived to form a portal of entry for micro-organisms, and investigation will often disclose in these lesions the presence of staphylococci, which there is reason to believe play an important rôle in the etiology of acute articular rheumatism. Sacaze reports a case of acute articular rheumatism with relapse, in which the pains were preceded by a septic wound of the foot, in which bacteriological examination showed the presence of staphylococci pyogenes albi. In two cases of enlargement of the tonsil attacks of angina were followed by the development of acute articular rheumatism, while in two others such an angina was accompanied by rheumatic symptoms. In a sixth case an attack of acute angina, complicated by purulent otitis, was followed by cerebral manifestations and development of the symptoms of rheumatism.

PSEUDOTABES WITH ARTHROPATHY.

RUHEMANN (*Deutsche medicinische Wochenschrift*, 1894, No. 44, p. 842) has reported the case of a man, sixty-four years old, with a previous history of untreated syphilis, who, fifteen years before coming under observation, suddenly observed a tumor as large as a walnut upon the inner aspect of the left knee joint, without inflammatory manifestations. The joint became gradually enlarged. There had never been lightning-pains, although for seven months there had been a feeling as though the chest and abdomen were encased in plaster. There was a sense of pain referred to the coccyx, associated with a feeling of oppression in the epigastrium, and aggravated by the taking of food. At times there were nausea and a tendency to vomit. For some time there had been a feeling in standing as if the soles rested upon sand, and formication was also observed in the hands. The ears and legs were cold; the knee-jerks were preserved; there was an absence of ataxia in the hands; the station was unsteady; the right external rectus muscle was paretic, and at times horizontal nystagmus occurred; the right pupil was larger than the left; both pupils were irregular, and failed to react to light and in accommodation; there was bilateral central retinitis; sensibility was preserved, although needle-pricks were sometimes appreciated as burning, and cold was mistaken upon the lower extremities for heat; hearing was somewhat impaired; the sense of taste was perverted, all articles of food tasting badly. The patient was irritable and depressed, and had delusions of persecution. The functions of bladder and rectum were normal. Sexual vigor was impaired. The patellar tendon-reflex was preserved upon the right side, but could not be elicited upon the left on account of the condition of the knee. The case is believed to be one of spinal syphilis, with especial involvement of the posterior columns, and is noteworthy on account of the presence of arthropathy.

The Sphygmomanometer.

Von Ziemssen has recently entered a strong plea for the more general use of von Basch's sphygmomanometer (*Münchener med. Wochenschrift*, 1894, No. 43) in its present improved form. All who have used the instrument heretofore agree in regard to the value of comparative measurements on the same individual at different times, but deny that the results in different cases and in the hands of different observers can be compared. The general truth of this belief cannot be denied, since the conditions in different individuals are necessarily variable. Experiments made in von Ziemssen's laboratory on healthy persons show, however, that the variations among healthy people are small as compared with those found in the sick, especially in cases of disease of the circulatory apparatus. For example, the pressure in the temporal arteries in normal subjects varies between 80 and 120 mm. of mercury, while in cases of contracted kidney and atheroma, with hypertrophy of the heart, a pressure of from 180 to 210 mm. is common. On the other hand, cases of cardiac insufficiency show a pressure as low as 60 mm. Von Ziemssen finds that the temporal artery just above the zygomatic process is the most suitable place for taking the pressure, although both temporal and radial should be measured in making exact studies. In making observations on the same patient at different times the same place should always be chosen, being marked for the purpose. It is also of some importance to make measurements in such cases at the same time of day, as the blood-pressure shows daily variations, with a rise from morning to evening. The instrument should always be compared with a mercurial manometer, as the graduation is not always correct (it is possible the maker will still further perfect the instrument in this respect). Von Ziemssen thinks the scope of sphygmomanometry is very extensive, and likely to become even wider, though its most important place will be in diseases of the circulatory apparatus, such as heart-diseases, arteriosclerosis, and contracted kidney. In these, repeated observations—single ones are of slight value—give valuable information, useful in diagnosis and prognosis, and also in treatment. Von Ziemssen confirms the statement of von

Basch, that arterio-sclerosis can be recognized by the sphygmomanometer long before it can be discovered by other means. Cases are cited which bear out this statement, and in which preventive treatment was followed by a subsidence of the symptoms, although the high tension continued. In such cases repeated measurements are very useful in prognosis. So long as the pressure does not increase, the outlook is generally good, since the arteries can withstand a constantly elevated pressure for a long time; but a sudden increase or gradual rise of pressure is of bad prognostic significance. On the other hand, sudden and marked fall of pressure is a bad sign. The case is cited of a man with contracted kidneys from lead-poisoning, with hypertrophy of the heart and arterio-sclerosis, with a permanent pressure in the temporals of 170–180 mm. Mild uremic symptoms, such as headache, dizziness, and indistinct vision, had existed for a long time. In an attack of severe uremia, with vomiting and loss of consciousness, the pressure fell to 40–50 mm., and remained at that relatively low point during the attack. An interesting observation was made on an old man with degeneration of the heart-muscle, who had Cheyne-Stokes breathing for many weeks. On account of injury from a fall it became necessary to tie the left temporal artery, and advantage was taken of this to measure the pressure with the manometer during both phases of the attack. At the same time the pressure in the other temporal was measured by the sphygmomanometer. The result of the comparative tests confirmed the experiments of von Basch on animals, *i.e.*, that arterial manometer and sphygmomanometer give comparable results. (In the case just mentioned the lowest pressure occurred in the period of apnœa, viz., 130 mm. The pressure rose from the beginning of dyspnœa, and at the end of that period was 150 mm. The case is to be reported in full.) Von Ziemssen intimates that in the infectious diseases observations on the blood-pressure furnish useful information for prognosis and treatment.

Although the name of von Basch gave his instrument is rather formidable, it is far preferable to the one von Ziemssen seems to be trying to substitute—the "Baschometer."

THE SPECIFIC IMMUNITY-REACTION OF TYPHOID BACILLI.

PFEIFFER (*Deutsche medicinische Wochenschrift*, 1894, No. 48, p. 898) maintains that the poison of typhoid bacilli resides principally in the bodies of the bacilli, and is not demonstrable in the filtrate of recent culture-media. By treatment with the vapor of chloroform, or by heating at a temperature of 54° C., for one hour, the bacilli may be destroyed without injury to their contained poison. The lethal dose of this poison for guinea-pigs is from three to 4 mg. per 100 grammes of bodily weight. In the blood-serum of animals rendered immune by means of the poison, anti-bodies appear which exert a specific bactericidal action upon typhoid bacilli. Colon bacilli and others resembling typhoid bacilli are not influenced in greater degree by such serum than by normal serum. With the aid of the specific anti-body of typhoid fever it is thus possible to differentiate typhoid bacilli from all others, including those concerning which morphological and biological study has hitherto left in doubt. Such anti-bodies are demonstrable in the blood of convalescents from typhoid fever. The etiological significance of the typhoid bacillus for typhoid fever thus receives additional important confirmation. Experiment has shown that properly conducted immunity-methods give rise to the presence of the specific bactericidal substance in the blood in marked concentration. Observations upon human beings suffering with typhoid fever must show whether or not the use of the serum of immune animals is capable of similar bactericidal effects in man.

A CASE OF HEREDITARY CHOREA.

At a recent meeting of the Johns Hopkins Hospital Medical Society OSLER (*Bulletin of the Johns Hopkins Hospital*, vol. v., No. 43, p. 119) reported the case of a man, twenty-eight years old, who at the age of eighteen first noticed slight twitching of the arms and hands, afterward involving the face, shoulders, and legs. The movements were progressive in intensity and extent, and finally interfered with manual labor. For some three months speech was affected. The man had a healthy appearance, with normal temperature and pulse, and presented no abnormality of the thoracic or abdominal viscera. Almost all of the muscles were involved in the movements. Those of the face were but slightly implicated, although the angle of the mouth was occasionally twitched and the eyebrows elevated. The muscles of the trunk were in constant, irregular action, resulting in elevation of the shoulders or slight movement of the body. The arms and hands were moved in an irregular, purposeless manner, the movements closely resembling those of chorea minor, although possibly a little slower. There was no trace of incoordination on involuntary movement. If seated quietly, the legs were shifted or flexed, or the toes turned up; the gait was a little staggering; there was some hesitancy in starting, and some swaying in walking. There was neither wasting nor spasm, nor rigidity, nor increase in the reflexes. There was complaint of undue readiness of fatigue. It was learned that the patient's mother had died at the age of forty-nine years of a disease similar to his. She had had nervous twitchings of the face as long as the patient could remember. The trouble grew gradually worse, so that she could not move from her chair, and she finally became bed-ridden.

One brother died at the age of thirty-two, of influenza, after he had been afflicted for eight years with the same sort of disease as the mother. Another brother and four sisters presented no motor peculiarity, and it could not be learned that any other members of the mother's family were affected.

NUMERICAL CHANGES IN THE COLORLESS BLOOD CORPUSCLES IN CROUPOUS PNEUMONIA.

From a study of the blood in twenty-two cases of croupous pneumonia BILLINGS (*Bulletin of the Johns Hopkins Hospital*, vol. v., No. 43, p. 105) arrives at the conclusion that in cases pursuing a favorable course there is a real and marked increase in the number of colorless corpuscles during the febrile period of the disease. This leukocytosis is probably present at the time of the chill, and may be very marked within a few hours. There is no correspondence during the febrile period between the daily temperature and the curve representing the number of the colorless blood-corpuscles. In cases in which the temperature falls by crisis the curve corresponding to the number of colorless blood-corpuscles begins to fall within a few hours of the same time. The fall of the latter is only partial, however, and rarely reaches normal as soon as the temperature-curve, generally taking about forty-eight hours longer. In cases ending by lysis the two curves fall together, the temperature always reaching normal first. In cases of delayed resolution the number of leukocytes may remain elevated for days. In a majority of cases the corpuscular curve rises during the period of fall of temperature, and may reach its maximum at that time. Such a rise is only transient, however, and is soon followed by a fresh fall. In cases with extensive involvement of both lungs, the number of colorless blood-corpuscles is likely to reach a higher point than in those cases in which the involvement is only moderate. The correspondence of lung-involvement and degree of leukocytosis is, however, a very rough one. In fatal cases leukocytosis may be present or absent. In those attended with leukocytosis some other cause of death than the virulence of the bacterial poison must be sought for. In cases presenting a complete and continuous absence of leukocytosis the prognosis is, as a rule, unfavorable. Continuous absence of leukocytosis is the exception, most cases showing this condition at some period of the disease. The possibility of an absence of leukocytosis being due to extreme mildness of the disease must not be overlooked. The leukocytosis of pneumonia is a so-called pure leukocytosis, *i. e.*, dependent upon an increase in the polynuclear elements solely. In cases showing no leukocytosis the blood-conditions were found normal. Further investigations are necessary, however, before the work of previous observers can be positively contradicted. The presence or absence of leukocytosis only shows the virulence of the bacterial poison, but is not to be considered a criterion of absolute prognosis.

THE PATHOLOGY OF TABES DORSALIS.

From a careful study of one old case of pure tabes, two recent cases of tabes associated with general paralysis, and one pure case of general paralysis NAGEOTTE (*La Semaine Médicale*, 1894, No. 64, p. 522) concludes that the primary lesion of tabes consists in an intense peri-neuritis, involving the posterior root between the ganglion and the entrance of the root into the arachnoid cavity. At first proliferative, this peri-neuritis at a later stage becomes fibrous, and is followed by degeneration of the fibres of the posterior roots. The anterior roots are involved equally with the posterior, but the former more effectively resist the interstitial changes than the latter. Nevertheless, indications of this lesion are found in the peripheral neuritis of motor type observed in some cases. The morbid changes in the nerve-roots are identical with those observed in the brain in general paralysis. There is no historic evidence to prevent acceptance of the belief that in both instances the lesions are of syphilitic origin.

VARIOLA COMPLICATED BY ACUTE MYELITIS.

AUCHE and HOBBS (*Compt. Rend. Hebd. des Sciénces de la Soc. de Biol.*, 1894, No. 28, p. 703) have reported the case of a woman, twenty-eight years old, who, in the stage of desiccation of an attack of discrete variola, was seized with weakness of the lower extremities, and a day later presented complete paraplegia, with anæsthesia, absence of the knee-jerk, paralysis of the rectum and bladder, and development of a bed-ulcer. Infection of the genito-urinary tract with the bacterium coli commune ensued, and death took place seventeen days after the onset of the complicating conditions. Upon post-mortem examination active congestion and slight hemorrhagic exudation were found without the dura mater, in the lower half of the dorsal region, extending to the level of the middle of the lumbar swelling. The vessels of the pia were dilated, and the posterior aspect of the cord presented sanguineous suffusions. The lumbar enlargement in its upper portion was the seat of a large area of myelitic softening; some of the pial vessels were the seat of thrombosis, and a fibrino-purulent exudation was present upon a portion of the posterior aspect. On bacteriological examination bacteria coli communes and streptococci were found upon the pia mater at the level of the focus of myelitis.

A FATAL CASE OF MULTIPLE NEURITIS.

At a recent meeting of the Clinical Society of London, CHURTON (*Medical Press and Circular*, No. 2895, p. 454) reported the case of a rather fragile girl, fourteen years old, who, two years before coming under observation, had choreic twitching of the eyes, supposed to be due to imitation of a school-friend. Some eight months later the shoulders and head also became affected slightly. Five or six weeks after this the girl went to a school-party and became excited and tired, and afterward walked two miles, and was quite exhausted. On the following day she still felt tired, and complained of a sensation of "pins and needles" in the fingers, and was unable to play the piano. On the next day she staggered in walking, and on the following day was in bed and complaining of pains in the calves of the legs. The temperature was now found to be 103°, and the paralysis advanced; gradually use of the arms, legs, and trunk was lost, and the reflexes were abolished. Attacks of rapid breathing occurred, and the heart's action was also rapid. Sensibility was preserved, and there was no œdema. Death took place six days after the onset of the acute symptoms. Analysis of the drinking-water used showed the presence of considerable quantities of lead, and especially in that from the hot-water pipe. It was further learned that the child had been in the habit of taking tea made with water from the latter. The fatal illness was ascribed to multiple neuritis due to chronic lead-poisoning.

SUDDEN DEATH FROM INTESTINAL HEMORRHAGE DUE TO TUBERCULOSIS.

BOUNAIX (*Archives de Médecine et de Pharmacie Militaires*, 1894, No. 11, p. 399) has reported the case of a soldier who presented constipation, pallor, headache, and nausea, without elevation of temperature or pulmonary complication. While under observation a large amount of blood was passed by the bowel, and the general condition became distinctly aggravated. Cerebral symptoms, agitation, syncope, and delirium appeared, and led to a fatal termination. Upon post-mortem examination a succession of hemorrhagic areas were found, extending from the lower portion of the ileum throughout the entire length of the large intestine. These foci were especially numerous in the region of the ileo-cæcal valve, where in places the mucous membrane was ulcerated; in other places were cicatrices. The mesentery was thickened; the mesenteric glands and those of the meso-colon were tuberculous.

SURGERY.

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TYPICAL FRACTURES OF THE RADIUS AND THEIR CAUSE.

BÄHR (*Centralbl. für Chir.*, 1894, No. 36) shows that the classical experiment of Lecomte, substantiating his claim that in these fractures the os scaphoid and pisiform do not come in contact with the ground is fallacious. This has been undisputed since 1860; but if, instead of marking the most prominent point of the volar side, which does not come in contact with the ground in these cases, but that portion which touches the paper when the arm is in extension and lies upon the flexor surface, is marked, we will find that when the arm is over-extended to the point where the hand is at a right angle, this point comes directly in contact and would naturally receive the force of the blow. Lecomte's experiment as an explanation of the mechanism of the fractures is therefore worthless. The author concludes from his observations that the typical radius fracture is not so much the result of a bending (the impression of earlier writers) as of an over-stretching of volar ligaments. Pure fissured fractures from hyper-extension can only be breaks of the volar edge of the articulating surface, or must run in a direction from above on the volar side downward to the dorsal side. All other forms of fracture can be explained by the impact of the upper carpal row upon the lower end of the radius.

THE SUBCUTANEOUS EXTIRPATION OF THE TUBERCULAR LYMPHATICS OF THE NECK.

Under this title DOLLINGER (*Centralbl. für Chir.*, 1894, No. 36) recommends the following method: The hair is shaved from the lower portion of the back of the head, and the entire head and hair carefully cleansed. The incision lies in this shaven region, beginning on a level with the external auditory meatus, one centimetre from the edge of the hair, and is a curved incision about five centimetres in length, convex below, and extending to the middle line of the neck. The incision is carried through the fascia as well.

The operator then works his way with the finger and periosteal elevator beneath the skin till the first gland is reached; it is seized with a volsella and dissected free with the finger and elevator. The head should be turned to the affected side during the operation, and any gland attached to the jugular vein should be brought to the external wound and carefully removed.

TRAUMATIC EPILEPSY.

LE DENTU gives (*La Presse Médicale*, June 9, 1894) the following as the known causes of traumatic epilepsy:

1. Fragments of bone resulting from the fracture of the skull; these may cause epileptiform convulsions immediately after the trauma.
2. Bony outgrowths due to traumatism of the cranium may cause epilepsy. This is, however, a rare event, as when a slow compression occurs the brain accommodates itself to the new conditions.
3. Meningeal cicatrices, following lacerations of the membranes by bony fragments. They are at first soft, but later are apt to become hard and adhere to the surface of the brain, when they are capable of determining epileptiform attacks.
4. It is the same with incipient chronic meningitis, which ends in sclerosis of the membranes.
5. Cysts resulting from intracranial hemorrhages occurring at the point of the fracture may cause attacks of epilepsy.
6. Arterio-venous aneurism. A case of this kind has been described by Warnots, of Brussels. He diagnosticated a blood cyst in a case of epilepsy which had been preceded by traumatism, and on opening the skull found the above lesion. The bone was not replaced, but the scalp was sutured. The patient was cured.

In operating for traumatic epilepsy it is not sufficient to remove a disk of bone; but if no lesion is found, the dura should be incised to permit of inspection of the subjacent parts, and even incision of the cortex of the brain may be practised, although the latter is generally followed by more or less lasting paralysis.

ON THE MODE OF DEATH IN CEREBRAL COMPRESSION, AND ITS PREVENTION.

VICTOR HORSLEY calls renewed attention in the *Quarterly Medical Journal*, 1894, vol. ii., part iv., to the fact that in fatal cases of cerebral compression death is due to respiratory failure. This has been experimentally demonstrated by a number of investigators, among the most recent of whom are Spencer and the author. Their results led them to the general conclusion that a rise of pressure within the skull caused a slowing and diminution of the respiratory movements, and later arrest of the same.

The three common causes of increased intra-cranial tension which have been submitted to surgical treatment are cerebral tumors, hemorrhage, and inflammatory foci. In each of these sudden death is apt to occur from arrest of respiration, unless the pressure be relieved by trephining.

Four cases of intra-cranial tumor—three of the cerebrum and one of the cerebellum—are cited in illustration of the subject. In one of these death resulted from respiratory failure on the morning of the day appointed for the operation. In the other three cases the failure of respiration occurred on the table during the operation for the relief of the cerebral condition. In each instance the patient turned suddenly white, the respiration became extremely shallow for a few breaths, and then stopped altogether. Artificial respiration was at once resorted to, and the skull rapidly and adequately opened over the supposed site of the tumor with the trephine and bone forceps. In every instance normal respiration returned, the movements being a little shallow at first, but soon assuming their customary proportions.

In experimenting on monkeys Horsley found that hot irrigations (100° to 105° F.) were very beneficial in removing the shock of the operative procedure and in restoring the activity of the respiratory centre. He therefore has an assistant irrigate the head freely with bichloride of mercury—about 1 : 10,000—at the temperature mentioned during these operations. In this connection he expresses doubt whether the routine treatment of applying an ice bag in head injuries ought not to be given up.

Attention is directed to the class of cases in which a person receiving a blow on the occipito-temporal region falls unconscious and dies, or, as is said, falls dead. Death results in these cases, according to Horsley, from respiratory arrest, and they are eminently cases requiring artificial respiration, although this seems to have been entirely ignored heretofore.

In concluding the author states that of all of the lower nerve centres which are necessary to the functions of so-called organic life, the respiratory centre is the most sensitive to mechanical pressure and shocks; that where death results in cases of intra-cranial pressure, artificial respiration should be immediately performed, and the skull opened freely at once; that in cases of sudden shock artificial respiration should be directly instituted, and that in every case heat should be applied to the head—preferably by irrigation.

On Resection of the Cardia.

Under this heading **Levy** describes in the *Centralblatt für Chirurgie*, 1894, No. 31, an operation which he has devised for removing the œsophageal extremity of the stomach. Resection of the pylorus has now become a not uncommon operation, and the author has sought to confer the same benefits on those patients suffering from malignant disease of the cardiac extremity as are offered those in which the disease is located in the pylorus. So far, the operation has been performed on cadavers and dogs only. An exhaustive communication is promised later; the object of the present writing is briefly to outline his method, which is as follows:

1. Incision through the abdominal wall, beginning in the middle line at the ensiform cartilage and extending to a finger's breadth below the navel, which is passed on its left side, and from this extremity of the wound a second incision is carried at a right angle through the right rectus muscle.

2. Isolation of the cardia. The wound is held open by retractors, the liver pushed to the right and above, and the stomach drawn downward and to the left. The small curvature and the lesser omentum then become visible. The latter is then cut through on the left side (the portion adjacent to the cardia), and double ligatures applied to the arteria and vena coronaria

ventriculi sinistra as near centrally as possible, after which the vessels are divided between the ligatures.

The arteria and vena coronaria ventriculi sinistra divide into a number of branches, which are distributed to both the anterior and posterior surfaces of the left portion of the stomach, which they grasp as a clamp and add considerably to the strength of its attachment to the posterior portion of the abdominal wall. The vessels will be most easily reached high up, if at the time of applying the ligatures the assistant turns the cardia on the axis of the œsophagus toward the left.

After cutting through the bloodvessels the cardia becomes more movable. An assistant passes the flexed index finger of the left hand—with the palmar surface forward—behind and around the stomach as far as possible above the fundus, and on the tip of his finger the thin layers of tissue which are reflected from the left side of the stomach to the posterior abdominal wall are divided.

3. Isolation of the lower part of the œsophagus. The serous covering is divided with scissors around the cardia; the anterior portion of the foramen œsophageum is freed from the diaphragm; every visible vessel (mostly branches of the phrenic artery) is caught; the cardia is drawn downward and isolated.

While isolating the œsophagus one must remember that an incautious cut might easily open the pleural cavity. The œsophagus and pleuræ are so closely applied to each other that when the cardia is drawn downward it is difficult to distinguish between the two. If the tension be relaxed, however, it will be observed that in the respiratory movements the pleura is inflated sail-like, which guides the operator to the dividing line.

If this point is accurately found, the œsophagus may be easily isolated with two anatomical forceps; only at the posterior surface will the scissors be required to assist in the dissection.

4. Excision of the cardia, union of the cut surfaces. Broad strips of gauze are drawn under the cardia to prevent infection of the peritoneal cavity at the time of dividing the intestinal canal. For the same reason large pieces of gauze should be placed under the borders of the abdominal wound to close off the abdominal cavity. The points are selected at which the alimentary canal must be divided above and below the new growth, but before making the incision the œsophagus is to be stitched to the stomach on the posterior half by a double row of sutures. Then follows the excision of the cardia from the stomach, preferably not by a single cut, as a large surface would thus be produced which could scarcely be securely closed during the suturing. The incision is begun on the left half, and carried around, portion by portion, the edges of the stomach being united as fast as the incision is made. When the stomach is entirely cut through its lumen is occluded by the fingers of an assistant, and the division of the œsophagus made near the point that has been sewn to the stomach. The œsophagus is divided, a portion at a time, and united to the stomach wound as it is cut; it is important thus to retain hold of the upper cut surface until the stomach and œsophagus are firmly united. Without this precaution the divided end of the œsophagus disappears in the foramen œsophageum, and suture is then scarcely possible. The author does not pass the sutures parallel with the

long axis of the œsophagus, but obliquely, as a better hold is thus secured. The suture having been completed, the gauze is removed and the abdominal wound closed.

PERINEAL DISPLACEMENT OF THE TESTICLE.

POLLARD reports (*The Lancet*, 1894, vol. ii., No. 2) a case of perineal displacement of the testicle in a child one month old, upon which he performed an operation for restoring the organ to its normal position. The right testicle in this case occupied a position in the posterior part of the fold between the scrotum and thigh. The corresponding half of the scrotum was flattened and badly developed. The testicle was not very movable.

The operation was performed as follows: An incision was made from just below the external ring to the lower end of the testicle, which with the spermatic cord and their coverings were raised from their bed, as in the operation of castration, and turned upward as far as the external abdominal ring. An incision was next made into the lower part of the scrotum, and a sinus forceps was thrust from this wound through the cellular tissue to the upper part of the first incision, near the external ring, and its blades separated to prepare a track for the artificial descent of the testicle. Through this track the testicle was pushed down to the bed prepared for it at the bottom of the scrotum. Both wounds were closed by sutures. The infant was discharged on the tenth day after operation.

The boy was seen again seven and one-half years after the operation. The right testicle was found to occupy its natural position and to be as large as its fellow. It also responded equally with the left one to the usual method of producing the cremasteric reflex.

So far as the writer knows, this method has not been adopted before. An objection to postponing this operation until the second year of life or later is that in the malposition the testicle is apt to be arrested in its development.

A RARE FORM OF TUMOR OF THE PAROTID.

MANDOWSKY reports the following rare case in the *Aerztlichen Praktiker*, 1894, No. 32. A woman aged twenty-three years consulted Prof. Schüller on account of a hard swelling under the lobe of the right ear in the parotoid region and on the corresponding side of the neck. Nine years previously an enlarged gland appeared in this situation and was removed. A swelling soon recurred, which increased very slowly at first, but it recently took on a rapid growth, appearing at the time somewhat larger than a pigeon's egg, and adherent to the surrounding tissues. Close under this swelling was a second growth about the size of a bean.

The tumor was situated between the origin of the sterno-mastoid muscle and the ascending ramus of the jaw close under the lobe of the ear; it was adherent to the surrounding structures, especially to the parotid glands, and it penetrated deeply into the retro-maxillary space. The growth was carefully dissected out, sparing as much as possible the nerves, vessels, and muscles. It was found necessary to remove a part of the parotid, as this was involved. Besides the tumor mentioned, nine or ten bean to cherry-sized glands were removed from the region of the angle of the jaw.

The tumor was found on examination to be a gumma, having originated in a lymph gland, and affecting the parotid secondarily. The enlarged glands were the result of chronic inflammatory hyperplasia. The syphilis was found in this case to be hereditary. According to Schüller, gumma of the parotid is of the rarest occurrence. The author was unable to find mention of a single such hereditary case in works on syphilis and surgery.

The wound healed by first intention, and the patient remained healthy. Facial paralysis did not follow.

THE OPERATIVE TREATMENT OF GASTRIC ULCER.

KÜSTER reports the case of a woman aged twenty-one years upon whom he operated for frequent and severe hemorrhage from the stomach (*Centralbl. für Chir.*, 1894, No. 30). Upon exposing the stomach it was found much dilated. On incising its wall a large, deep ulcer, with undermined edges, was to be seen in the posterior surface. The ulcer, which was adherent to the pancreas, was burnt with the thermo-cautery. As the pyloric orifice was so small that it could not be found readily, it was decided to perform gastro-jejunostomy, the opening being made two and one-half inches in width. The patient recovered, and when last seen there had been no recurrence of the hemorrhages. She was able to take her usual food and to work with comfort.

Küster draws the following conclusions from this case:

1. Hemorrhage from a gastric ulcer may be arrested by a single application of the actual cautery.
2. When the gastric ulcer is situated near the pylorus, gastro-enterostomy is preferable to pyloroplasty, as the latter will not prevent cicatricial contraction and stenosis.
3. A wide anastomotic opening between the stomach and intestine is in no sense a disadvantage, but, on the contrary, will insure the patient against the risks of undue contraction later.

RUPTURED INTESTINE FROM ACCIDENT; LAPAROTOMY; SUTURE OF GUT; RECOVERY.

THOMAS records the following case (*British Medical Journal*, 1894, No. 1747): Woman, aged fifty-five years, while carrying a chair, inadvertently struck the door-post, bringing her abdomen into violent contact with the chair. This caused severe pain, and she vomited immediately afterward; the symptoms continued in an aggravated form. As she had been operated upon four years previously for a strangulated femoral hernia, and as a small lump was apparent at the site of the old scar, it was thought that there had been a recurrence of the hernia. On cutting down at this point the lump was found to be the sac of the old hernia; but a few ounces of putrid serum escaped, which indicated a rupture of the intestine. The femoral sac was ligated, and the wound thoroughly carbolized. A two-and-a-half inch incision was next made below the umbilicus, through which the intestine was examined. A small opening, one-quarter by three-quarters of an inch, was found on the side opposite the mesentery. This was closed with Lembert sutures. Recovery was prompt and uneventful.

The following are the interesting features of the case: 1. The slight accident. 2. The opportunity presented for examining a case of radical cure of hernia. 3. The absence of symptoms in so severe a case of septic peritonitis, only distention and tenderness being present. 4. The intense fecal odor of the serum that escaped from the femoral wound made the diagnosis of ruptured intestine certain. 5. The use of carbolic lotion (1 : 100) on account of the great septicity, without any untoward result. 6. The bowel being normal around the aperture made the suggested tearing away of bowel adherent to the site of radical cure improbable.

THE CAUSE AND TREATMENT OF THE NEURALGIAS OF SCARS AND STUMPS.

In continuation of his researches in these troublesome forms of neuralgia, **WITZEL** (*Centralbl. für Chirurg.*, 1894, No. 23) states that his experience in the dissection of stumps shows that the bulbous enlargement of the distal nerve-ends is normal in all cases, and is not found alone in cases where neuralgia is present. He therefore believes that these so-called neuromatas are not the cause of the neuralgic pain. He would attribute this to the fixation of the nerve preventing its movement in the direction of its longitudinal axis, and in cases which he cites he found the nerve bound down and this motion restricted. The releasing, drawing down, and excision of a portion of the nerves produced permanent relief. He advises as a prophylactic measure the drawing down and section with a sharp knife of all large nerve-trunks in amputations or disarticulations, while primary union without suppuration tends, by reducing the amount of irritation and scar tissue, to diminish the liability to neurotic involvemnt.

OPHTHALMOLOGY.

UNDER THE CHARGE OF

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DRAINAGE OF THE EYE.

PFLUEGER (Berne) holds (*La Semaine Médicale*, 14 Ann., No. 46) that drainage of the eye, with or without antiseptic injections, is indicated in grave infection of the anterior chamber, in kerato-conus, in recent detachment of the retina, and in confirmed glaucoma. To maintain drainage, he has used a small piece of rubber cut in the form of a cross, of which one short arm is, after paracentesis, thrust about two millimetres into the anterior chamber. The other arms are introduced and fixed beneath the conjunctiva. When it is necessary to practise washing out of the anterior chamber the drain should be changed frequently. In kerato-conus, however, it may remain in position for several days. This treatment, which Pflueger states is free from inconvenience, has been most successful in kerato-conus and glaucoma.

FATIGUE OF THE RETINA OR OF THE OCCIPITAL LOBE.

GROENOUW (Breslau) has made a series of observations to test the correctness of Schiele's conclusions, that when, by long-continued perimetric examination of one sector of the visual field, the eye becomes so fatigued that the outer limits of the sector become progressively narrower, examination of the eye hitherto covered will show a decided contraction of the sector homonymous to that fatigued; and that this indicates a fatigue of the occipital lobe rather than of the retina.

Groenouw, however, finds (*Archives of Ophthalmology*, vol. xxiii., No. 3) that the fatigue curves do not run with the regularity that Schiele claims, but cross one another in manifold ways; that fatigue of one sector of a visual field is almost always accompanied by changes in the outer borders of the other sectors of the field of the same eye; that in the second eye sectors homonymous to those fatigued often did not show analogous changes, while sectors not at all homonymous to the fatigued sectors did give evidence of having been influenced. Hence he finds the evidence wanting that so-called fatigue of the retina is really fatigue of the cortex of the occipital lobe.

A NEW ACTIVE METHOD OF TREATMENT OF ACUTE GRANULAR CONJUNCTIVITIS.

WICHERKIEWICZ (Posen) employs and recommends (*Internationale klinische Rundschau*, viii. Jahrgang, No. 33) the following plan of treatment for this disorder: Both lids are so strongly everted that the retrotarsal folds affected by the inflammatory process are fully exposed. The surface is then thoroughly cleansed by a vigorous continuous stream of 3 per cent. solution of boric acid from the undine. In very sensitive or timid persons a 5 per cent. solution of cocaine may be employed.

The surface of the conjunctival sac having been freed from secretion, an ointment of sublimate (1 to 500, or 1 to 1000) is applied with a brush or probe, and the eye is covered with a dressing soaked in a solution of tannin (10) in glycerin (100 parts). This is covered with an impervious layer and the whole dressing sustained with a flannel bandage.

When both eyes are affected one may be treated thus one day, the other the next. The treatment is not painful for the patient, nor need it be very protracted.

INFLUENCE OF THE CORRECTION OF AMETROPIA ON THE INCREASE OF MYOPIA.

RISLEY (Philadelphia) reports (*Archives of Ophthalmology*, vol. xxiii., No. 3) the results of an extended statistical study of this subject. From his own case-books and the prescription-books of two large optical companies he obtained the formulas for correcting glasses of about two hundred thousand eyes that had been treated and fitted with glasses in a period of twenty years, during which time the careful correction of ametropia had come to be generally practised in Philadelphia. These were grouped, according to the time at which the eyes had been presented for treatment and correction, into five periods. Thus grouped they show a steadily progressive decline in the number of myopic eyes from 28.43 per cent. in the first period to 16.78 per cent. in the last. He shows also that this decline is chiefly in the higher grades of myopia; while in the lowest grade, 1 D. or less, there has been a slight increase. The study separately of the statistics in the private case-books, and of those from the opticians' books shows practically the same thing in both. The results of this study, Risley believes, confirm the view he has advocated, that myopia was largely due to the strain of close work in eyes presenting other forms of ametropia, especially astigmatism.

Bacterial Origin of Descemetitis.

H. Snellen (Utrecht), having performed sclerotomy for the increased intra-ocular tension which accompanies this disease, one of the characteristic dots of opacity which are situated on the posterior surface of the cornea came out, and he examined it microscopically. He reports (*Ophthalmic Review*, vol. xiii.. No. 154) that it consisted of microbes, very short bacilli that grew, but very slowly, in agar-agar. Later the other eye of this patient becoming affected, a dot obtained from it showed the same microbic composition. From another patient in a later stage of the disease a third dot was obtained. It was found to consist of cells, as described in the books, but between them were microbes similar to those seen in the first case, but which he did not succeed in cultivating. Whether all cases of descemetitis are due to the same cause, or whether in some cases the dots are a real deposit after inflammation of the deeper parts of the eyeball, further investigations must decide.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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Neuropathic Exulceration of Tonsil, Palate, and Uvula.

Dr. Benjamin F. Westbrook, of Brooklyn, reports (*N. Y. Med. Journ.*, 1894, No. 833) a unique case of multiple neuritis following intense mental application and excessive toil in a scientist and inventor, fifty-one years of age. Multiple diffuse neuritis had existed for about a year. Among other manifestations, there was the most intense neuralgia of the left side of the face, including the ear, nose, and tongue, with hyperæsthesia so pronounced that the most delicate touch gave agonizing pain. Finally, difficulty was experienced in swallowing, and commencing ulceration of the left tonsil was noted. The pain and the dysphagia increased from day to day until at the end of two weeks liquids only could be swallowed, and only with intense pain. The ulceration had then denuded the entire buccal face of the left tonsil and had extended to the outer two-thirds of the anterior palatine fold, which it threatened to destroy, thence invading the surface of the palate almost as far as the base of the uvula. Cauterization with pure creosote produced some sloughing, and perhaps some subsidence in the rapidity of the ulceration, which still increased, the pains continuing without abatement.

It was at this time that Dr. Westbrook was first consulted. The ulcerating area involved the anterior surface of the velum as far as the middle line, and to a point about a centimetre from the base of the uvula. Quite a large notch had been produced at the junction of the left border of the uvula with the free border of the velum. The outer half of the posterior surface of the velum and posterior palatine fold was included in the ulcerative process, which had reached downward as far as the pharyngo-epiglottic fold. The color of the mucous membrane was crimson rather than scarlet, and indicative of venous stasis. The left tonsil was much enlarged, and the submaxillary glands of the left side were enlarged. The urine was hyperacid and remained hyperacid throughout the twenty-four hours. There were several evidences of diffuse neuritis in the pupils, small bloodvessels, drum membrane, carotid pulsations, and in the gums. Under aseptic topical treatment, alkalinization of urine as far as practicable, and anti-rheumatic treatment constitutionally, for details of all of which the original article must be referred to, the progress was steadily toward recovery, which became complete at the end of four weeks.

MORBID GROWTHS OF THE LARYNX.

DR. H. S. BIRKETT, of Montreal, reports (*New York Medical Journal*, 1894, No. 833) a case of subchordal spindlec-elled sarcoma of the larynx successfully removed by thyrotomy, in a lady twenty-two years of age.

DR. CHARLES H KNIGHT, of New York, reports (*idem.*, 1894, No. 835) three cases of laryngeal neoplasm. One of these is rather rare, a case of diffuse subglottic myxoma. After partial eradication through the mouth, tracheotomy was performed and radical extirpation practised through the wound. The other two were instances of papilloma. One was a case of multiple papilloma removed with forceps, with recurrence and removal in twelve months, and a second recurrence and removal five years later.

CARCINOMA OF THE LARYNX.

PROF. VIRCHOW, in an address before the Berlin Medical Society (*Berliner klin. Wochenschrift*, 1894, No. 31), demonstrated "preparations from two cases of carcinoma of the larynx cured by extirpation of the larynx." [It is hardly right to say that the carcinoma of the larynx was cured by the extirpation. It was bodily removed.]

In one instance the patient was cured of his carcinoma and died of pneumonia four and a half years later. This was one of Thiersch's cases operated on in 1880. No evidence of carcinoma was discoverable anywhere. The other case was one of Wolff's cases operated on in October, 1891, which died two and a half years later of metastases in the lung and in a bronchus. The preparations are minutely described, and one of them is illustrated.

Dr. Julius Wolff supplemented Virchow's remarks with a review of his own case, and then presented a general statement of cases that had lived considerable periods after the operation. Four were living respectively thirty-two months, three and a half years, four and one-third years, and four and a half years, without any signs of recurrence. Three had remained free from recurrence from four and a half to six years, and had then died of intercurrent diseases. Three had died from intercurrent diseases between twenty and twenty-two months after operation, and without recurrence. In one case of Thiersch's, and this the only one of its kind, there were, in addition to a local recurrence, metastases in other organs: cancerous lymphatic glands in the neck and in the mediastinum, and metastases the bulk of a walnut in the lungs.

Operations on the Nasal Septum.

At the last meeting of the American Laryngological Association, Dr. Thomas R. French, of Brooklyn, read a timely paper, entitled "Observations on Some of the Results of Cutting Operations on the Nasal Septum," which gave rise to animated discussion (*New York Medical Journal*, 1894, No. 835). It had reference to perforations left by attempts to cut off the thickened portions of the deflected septum and the occurrence of adhesions between the septum and the turbinated bones. It was shown that such results were not always due to lack of skill on the one hand, and that the results were not as disastrous as might be supposed on the other. Nevertheless it was admitted that in many instances these results were due to lack of judgment in operating, lack of skill in operating, and lack of care after operating.

OBSTETRICS.

UNDER THE CHARGE OF

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Rupture of the Uterus; Abdominal Section; Suture and Drainage; Recovery.

Piccinini reports in *Il Policlinico*, 1894, No. 21, a case of rupture of the uterus happening at the Trastevere Maternity in Rome. The patient was a multipara who had borne two children after prolonged and difficult labors. The child was delivered by forceps, asphyxiated, but was revived. An examination made after delivery showed a transverse rupture of the uterus at the juncture of the lower uterine segment with the upper contractile portion. The abdomen was immediately opened, and a quantity of blood partially coagulated was sponged out. The laceration had been an extensive one, extending to the posterior fornix of the vagina. The uterus was closed by suture, the peritoneal surfaces being carefully brought together, and a large strip of iodoform gauze was carried through the lower angle of the uterine wound and into the vagina. The muscular, cutaneous, and peritoneal surfaces were sutured separately. The operation consumed an hour and a quarter. The gauze was entirely removed on the sixth day, and the patient made an uninterrupted recovery.

Ectopic Abdominal Gestation; Cœliotomy; Delivery of a Living Fœtus.

An interesting case of this sort is added to the records already existing by Werder (*Medical Record*, 1894, No. 21, vol. xlvi.). On opening the abdomen a yellowish-white cystic tumor was exposed; on opening the cyst, the child at once presented, and was rapidly delivered by the feet. The cyst was adherent to numerous loops of intestine, and terminated between the folds of the broad ligaments near the uterus. An attempt to extirpate the cyst resulted in severe hemorrhage from a partial separation of the placenta, which was spread out over the spinal column and the right posterior wall of the pelvis. The ovarian artery and branches of the uterine artery were caught by clamps, after which it was comparatively easy to remove the placenta without hemorrhage. The free portion of the cyst was excised, the ovarian and uterine arteries tied, and the remainder of the sac was drawn together by silk sutures; the cavity of the cyst was packed with iodoform gauze, and the abdominal wound closed to the gauze. The child was resuscitated, but died on the third day after birth, with rapid breathing and fever. No autopsy was obtained. The mother made a good recovery. Werder has collected and tabulated seventeen cases, including his own.

Traumatic Hæmatothorax in a Newborn Infant.

In the *Zeitschrift für Geburtshülfe*, 1894, Band xxx., Heft 2, Gebhard reports a case of a child born in breech presentation, the mother's pelvis being slightly larger than the average. During the birth the fœtal heart-sounds became slow, and the physician in attendance rapidly extracted the child, the extraction occupying three minutes. The child was a male and well developed; it was born asphyxiated, and resuscitated, Schultze's method being employed among others for this purpose. Three hours after birth the child died. Post-mortem examination revealed fluid blood in the right pleural cavity, with compression of the right lung, and further examination showed that during the extraction the chest of the child had been brought with such force against the mother's sacrum as to cause the partial laceration of the pleura and the hemorrhage in question. This injury was further increased by the resuscitation by Schultze's method, the pressure of the hands of the operator while swinging the child increasing the injury already done.

CHLOROSIS AND ECLAMPSIA.

An interesting observation, throwing light upon the causation of eclampsia, is made by SÉCHEYRON (*Archives de Tocologie*, 1894, No. 11). The case was that of a young woman, aged twenty-one years, who suffered from chlorosis before her marriage. When pregnancy occurred there resulted a progressive failure of digestion and assimilation, with obstinate constipation, headache, and finally eclampsia. She was delivered of a dead child at eight months. Although efforts had been made to move the bowels during pregnancy, they had been unsuccessful, owing largely to the patient's refusal to submit to treatment. After delivery the patient was treated by enteroclysis, with the result of removing a mass of exceedingly fetid matter from the bowel. A solution of naphthol, 1 to 2000, was employed as an intestinal antiseptic.

APPENDICITIS DURING PREGNANCY.

MUNDÉ describes, in the *Medical Record*, 1894, vol. xlvi., No. 22, a case of pregnancy complicated by appendicitis. The diagnosis was difficult by reason of the absence of localized pain, the pain from which the patient suffered being referred to the lower portion of the abdomen, and not to the region of the appendix. Labor resulted in the birth of a dead child, which had been dead about twenty-four hours. The placenta was readily delivered, and there was no post-partum hemorrhage, but the patient went into a semi-delirious condition, and appeared much prostrated. She had suffered from fever, with rapid pulse before and during her labor. Following labor, the abdominal tenderness, which had been very great and diffuse, subsided sufficiently to reveal decided dulness in the right iliac region. *Per vaginam* no exudate could be found in the pelvis. Appendicitis was diagnosticated, and after waiting for the abscess to become encapsulated, it was opened and drained; the mother made a good recovery.

THE INFLUENCE OF PROLONGED LABOR ON PUERPERAL TEMPERATURE.

In the *Transactions of the London Obstetrical Society*, 1894, p. 238, GILES describes his researches in 600 cases of labor with a view to determine the effect upon the temperature of the duration and character of the labor. He finds that in normal cases labor produces but a very slight rise of temperature, the length of the first stage of labor affecting the temperature of the patient but very little. If the second stage is prolonged, however, the temperature rises in proportion to the length of this stage. The time of day at which delivery takes place has very little influence on the patient's temperature. The administration of chloroform during the second stage commonly results in a low temperature after delivery, and the same is true of the use of forceps under chloroform. It is interesting to observe that in twelve cases of normal labor in which the second stage averaged but thirty-five minutes, the giving of an intra-uterine douche raised the temperature to 99.4° F.

SYMPHYSIOTOMY.

Symphysiotomies are reported, among others, by the following operators: Assistant Surgeon SHAH (*Indian Medico-Chirurgical Review*, 1894, No. 8) operated upon a Hindu woman, aged twenty-two years, who was in active labor. The membranes had ruptured, all the amniotic liquid had escaped. The pelvis was not accurately measured, but the promontory of the sacrum was found projecting further than normal; the conjugate diameter is given as about 2¼ inches. The coccyx was immovable. The patient had already borne two children, both deliveries having been spontaneous. After the second birth the patient became a cripple from rheumatism. The operation was performed by inserting a pointed bistoury, and then a probe-pointed bistoury, severing the joint. The sub-pubic ligament was divided by a herniotomy knife; the operation was done subcutaneously, the tendons of the recti muscles being also severed. The pubic bones separated two inches, and the child was born a half-hour later in spontaneous labor. The child was stillborn, and although it subsequently breathed, it perished soon after with high temperature and difficult breathing. After the expulsion of the placenta the womb contracted well, but a sharp attack of hemorrhage followed. The patient was treated by a tight pelvic bandage, and the free use of iodoform over the wound. She gradually made a good recovery, and three weeks after labor was in good condition.

GARRIGUES (*Medical Record*, 1894, No. 19) performed symphysiotomy to deliver a patient whose labor was complicated by a pelvic tumor. The child was delivered by forceps, and was asphyxiated, but revived. The pubic bones separated five inches after the delivery. The patient was treated by immobilization of the pelvis with rubber adhesive plaster, and iodoform-gauze drainage of the wound. Pus formed in the wound, which required the use of a thin drainage-tube. Three weeks after delivery the tumor in the pelvis had disappeared, and on the thirty-fourth day after the operation she left the hospital. Three months after delivery the child was in excellent condition; the mother could lift her child, and walked with a waddling gait, and the examination showed cystocele and occasional pain in three joints of the pelvis. The upper portion of the ends of the pubic bones was in apposition, but the lower portions were asunder a half-inch.

HARRIS (*American Journal of Obstetrics*, 1894, vol. xxx., No. 6) reports a symphysiotomy in a primipara with 7½ cms. antero-posterior pelvic diameter. Symphysiotomy was performed by cutting in the median line, 4 cms. above the symphysis, to within 1 cm. of the clitoris; the joint was divided from before backward with an ordinary scalpel, and the sub-pubic ligament with a blunt-pointed bistoury. The symphysis separated about 6 cms. A living child, weighing ten pounds, was delivered by forceps; gauze drainage was employed at the lower angle of the wound, with rubber adhesive plaster to immobilize the pelvis. The patient made an uninterrupted recovery.

HARRIS performed symphysiotomy later in a primipara, aged twenty-five years; the os dilated well, but the occiput persisted in rotating posteriorly. The forceps was applied, but without success. The conjugata vera was about 7 cms.; distance between the anterior superior spines, 22 cms. The left leg was 2 cms. shorter than the right, and the line of the symphysis 1 cm. to the left of the mid-line. The operation was performed as in the previous case, and the symphysis separated 5 cms. The separation was due chiefly to motion of the right side, the left half moving but little. Great difficulty was found in detaching the suspensory ligament of the clitoris, which was very firm, and its base almost cartilaginous. Very little hemorrhage followed the operation. The child, weighing eight pounds, was delivered by forceps. The left side of the pelvis not yielding readily, its sharp inferior corner left a groove over the right frontal region of the child's head; the most serious complication was that this corner perforated the anterior wall of the vagina as the head passed through. The external wound was closed, an iodoform gauze drain left in its lower angle, and the vagina at the seat of the perforation packed with iodoform gauze. This patient made a good recovery, and has now, eight weeks after the operation, no trouble in walking; there is firm union of the symphysis; no pain or soreness; no prolapse of the anterior wall of the vagina. The child is living and well.

At the meeting of the New York Obstetrical Society, October 2, 1894, JARMAN reported a symphysiotomy in a patient with generally contracted pelvis, the internal conjugate measuring three and one-quarter inches. The child was delivered by version, which was exceedingly difficult. During extraction the bladder was forced against the sharp edge of the pelvic bones, and lacerated. The bladder was drained for two days by a tube passed through the wound and into the bladder. The patient made an uninterrupted recovery, and was able to nurse her child. The infant was a healthy male, weighing six pounds twelve ounces.

GYNECOLOGY.

UNDER THE CHARGE OF

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CYSTS OF THE CORPUS LUTEUM.

FRANKEL (*Archiv für Gynäkologie,* Band xlviii., Heft 1) has made careful microscopical studies of these cysts, which are distinguished by the following peculiarities: Macroscopically the cyst-wall presents a yellowish color, is thrown into folds, and can be peeled off from the subjacent tissue. The contained fluid is either thin or syrupy in consistence, and of a reddish-brown or yellow color. Under the microscope the lining membrane is seen to be rich in capillaries, between which lie large multi-nucleated pigment-cells and groups of leucocytes.

That these cysts possess considerable clinical as well as pathological interest is evident from the number of cases in which they have given rise to such symptoms as to demand surgical interference.

It is not always possible to decide whether the accompanying pelvic peritonitis is the cause, or the result, of the cyst-formation. The writer decides from his investigations that large, apparently unilocular, ovarian cysts may undoubtedly arise from the confluence of adjacent dilated follicles. A combination of multilocular glandular cystoma with cysts of the corpora lutea has also been noted.

CLASSIFICATION OF UTERINE SARCOMATA.

PICK (*Ibid.*) concludes a lengthy paper on this subject with the following résumé. The transformation of uterine fibro-myoma into sarcoma is due to a direct change of smooth muscle-fibres into sarcoma-cells, as well as a development from the connective tissue or vessel-walls of the primary growth. Neoplasms having the former origin are to be regarded as true mixed growths (*myoma sarcomatosa*). Œdematous fibroids are identical in structure with myxomata, though such œdema may give rise to a true metaplasia, dependent upon the capacity of the young cells for secreting mucin. Œdema and myxomatous changes may coexist in the same tumor. Papillary sarcoma found in the cervix uteri, as well as in the vagina, in children, is distinguished by its resemblance to a bunch of grapes, its development from the mucous membrane, and clinically by its extreme malignancy. This is not to be regarded as a separate variety of myxo-sarcoma. Its grape-like development is due simply to the presence of pre-formed cavities which become dilated. It is different from the dropsical forms of sarcoma found in the uterine body, which do not originate or extend in the mucosa like the *sarcoma botryoides* of the cervix and vagina.

Hyaline degeneration is frequently observed in uterine sarcoma, but it seems to bear no relation to other degenerative processes.

CARCINOMA DEVELOPING FROM THE CHORIONIC VILLI.

FRÄNKEL (*Ibid.*) describes a fatal case of malignant disease of the corpus uteri following the removal of a vesicular mole. The growth had a papillary form, invaded the deeper tissues, and gave rise to metastases. Microscopically it was shown to have originated from the remnants of chorionic villi left after removal of the mole, since the structure of the uterine glands was still recognizable, and its histological appearance was quite different from that of cancer of the corporeal endometrium. This is an entirely different form of malignant disease from the *sarcoma deciduo-cellulare* of Sänger, but bears a close resemblance to Gottschalk's sarcoma of the chorionic villi. Meyer has also described a case of epithelioma of the villi.

THE RESULTS OF CASTRATION FOR FIBRO-MYOMA.

HERMES (*Ibid.*) reports seventy-eight cases from the Halle Clinic, with a mortality of about six per cent. In only two instances were the ovaries found to be healthy. The cases selected for the operation were those in which there was an interstitial tumor, not extending above the umbilicus, and causing hemorrhage and pressure-symptoms which could not be relieved by other methods of treatment. If it is found after opening the abdomen that the ovaries cannot be thoroughly removed, the writer thinks that it is better to resort to a more radical operation. As regards the results, the hemorrhages ceased entirely in forty cases, menstruation persisted irregularly in nine, and at regular intervals in two. In forty-five the tumor diminished in size, in two it was unchanged, and in one it continued to grow.

VAGINAL HYSTERECTOMY WITH DRY ASEPSIS.

KURZ (*Münchener med. Wochenschrift*, 1894, No. 48) recommends highly the use of dry asepsis in vaginal extirpation of the uterus, with complete closure of the peritoneal cavity afterward. He cleanses the vagina beforehand with soap and water, and uses no irrigation subsequently, dry gauze being employed for sponging. No pad is introduced into the peritoneal cavity when it is opened, as the patient's hips are elevated so as to prevent prolapse of intestine. All ligatures (silk) are cut short, and the peritoneal and vaginal wounds are closed, the edges of the two having been previously united in the usual manner during the operation.

The writer believes that the use of irrigation after the peritoneum is opened is dangerous, since it either irritates that membrane if an antiseptic fluid is used, or fragments of cancerous tissue may be carried into the cavity. By the use of dry gauze the field of operation can be kept much clearer than is possible under continuous irrigation. If the hips are elevated, it is unnecessary to introduce a pad into the peritoneal cavity at all.

Finally, since vaginal hysterectomy is practically a cœliotomy performed per vaginam, the ideal method in the vaginal, as well as in the abdominal operation, would seem to be to cut the ligatures short, and thus to provide against the possibility of secondary infection, which may occur if they were allowed to hang into the vagina. For the same reason the wound is closed without drainage, the latter being, as the writer properly remarks, "a thing which we have learned to regard as of very doubtful value."

In a case of extensive cancer of the cervix involving the vaginal fornix the writer states that he operated according to this method only four weeks after delivery, and the convalescence was so rapid that the patient was able to leave her bed at the end of a week.

CONTRACTED BLADDER IN WOMEN.

In a paper on this subject (*Medical Chronicle*, November, 1894) SINCLAIR describes an obstinate form of frequent micturition due to diminution in the normal capacity of the bladder, which resists all medicinal treatment. He treats these cases by gradual dilatation of the bladder, by filling the organ with warm boric acid solution, slowly injected into it from an ordinary irrigating-jar. As much fluid is introduced as can be borne, and the patient is encouraged to retain it as long as possible. The treatment is continued at intervals of two or three days, until she is able to retain her urine for the usual time. The writer denies that there is any other satisfactory cause of the symptom to be found in these cases—either accompanying disease of other pelvic organs, an abnormal condition of the urine or hysteria, masturbation or sexual continence, as suggested by Skene.

[As the writer promises a more extended paper on this subject, we would call his attention to the fact that this condition was described several years ago by Dr. H. Marion Sims in a paper read before the New York Obstetrical Society, who also treated it successfully by the identical method of gradual hydrostatic pressure.—H. C. C.]

DILATATION OF THE CERVICAL CANAL WITH DRAINAGE-TUBES.

RICHARD BRAUN (*Wiener klin. Wochenschrift*, 1894, Nos. 46 and 47) describes the following method of gradual dilatation which he has practised successfully. After thorough disinfection of the vagina, a piece of aseptic rubber tubing is stretched over a sound, and is thus passed through the os internum. The sound is then slipped out and the tube is left *in situ* for twenty-four hours, when it is removed and one of larger size is introduced. In two or three days considerable dilatation of the cervical canal is obtained, without pain to the patient and with no risk from the retention of secretions, as when an ordinary tent is used. Moreover, the flexible tube adapts itself to the shape of the canal, and a flexed uterus is not forcibly straightened. The writer regards his method as particularly useful in the induction of premature labor and in cases of incomplete abortion with rigid cervix.

PÆDIATRICS.

UNDER THE CHARGE OF

LOUIS STARR, M.D.,

OF PHILADELPHIA;

ASSISTED BY

THOMPSON S. WESTCOTT, M.D.,

OF PHILADELPHIA.

THE BACTERIOLOGY OF SUPPURATIVE OTITIS COMPLICATING SCARLATINA.

BLOXALL (*British Medical Journal*, 1894, ii., p. 116) presents the results of a bacteriological study based upon examinations of the discharge in fourteen cases of otitis complicating scarlatina. The table shows that the shorter the interval between rupture of the membrane and the examination of the discharge, the more the pyogenic cocci predominate over rod forms. Cases examined on the first day showed almost pure cultures of cocci, while in the cases taken after a few days the presence of adventitious organisms, such as yeasts and sarcinæ, was very marked. But even in the earliest cases the cocci were not in pure culture, but were associated with bacili and, in one case, with spirilla, which had probably ascended from the mouth and air-passages.

In the fourteen cases the organisms were found as follows: Streptococcus pyogenes, 12 times; bacillus striatus albus, 9 times; staphylococcus pyogenes albus, 8 times; staphylococcus pyogenes aureus, 5 times; micrococcus albus liquefaciens, 3 times; bacillus acidi lactici, twice; bacillus subtilis, bacillus pyocyaneus, bacillus tuberculosis, each once. This list shows the frequency of the streptococcus pyogenes, and that, contrary to Kanthack's investigations on ordinary cases of middle-ear disease, the diplococcus pneumoniæ was never found. It may be stated in this connection that great care was directed to the discovery and recognition of the diplococcus.

The conclusions from this study, therefore, show that the streptococcus pyogenes is the most potent factor in the etiology of otitis media of scarlet fever; that the less chance there is of contamination from the outer air through the external orifice, the more the pyogenic cocci predominate over rod forms, but that prior to perforation the occurrence of such organisms is not precluded, since they may ascend by the Eustachian tube from the mouth; that next to the streptococcus the most important organisms are the staphylococcus albus and aureus; and, finally, that apparently the diplococcus pneumoniæ of Fraenkel or the bacillus pneumoniæ of Friedländer does not play such an important part in the otitis media of scarlet fever as in that due to other causes.

STRANGULATED HERNIA IN A BABY OF FOUR WEEKS.

HAVEMANN (*Deutsche medicinische Wochenschrift*, 1894, No. 34) reports a case of strangulated inguinal hernia in an infant four weeks old. The patient was a boy with a congenital scrotal hernia of the right side. Symptoms of strangulation began suddenly with vomiting and arrest of the bowels, the fecal movements being replaced by evacuations of mucus mixed with a relatively large quantity of blood. There was probably much pain, for the baby cried incessantly. When the author first saw the child, about forty-eight hours after the beginning of acute symptoms, taxis failed, so that operation was determined upon, but owing to lack of facilities had to be postponed till the next day. Recovery was uninterrupted.

The author insists upon the importance of the bloody stools in this condition. The flow of blood from the anus appeared with the beginning of acute symptoms, and promptly disappeared after the operation; it therefore depended upon the strangulation. The blood was venous in appearance, and came evidently from the intestine subjacent to the strangulation, and very probably from the hemorrhoidal veins which open directly into the inferior vena cava.

SEROTHERAPY IN DIPHTHERIA.

A note in the *Revue Mensuelle des Maladies de l'Enfance*, Nov. 1894, p. 642, calls attention to an important point to be observed in cases in which the serum treatment is used. This is the observation that the serum treatment considerably increases the patient's intolerance to chemical toxics, especially the commonly-used antiseptics. In such a case requiring intubation occurring in the service of Dr. Moizard, the tube used had been washed in a 5 per cent. solution of carbolic acid. Its introduction was followed by darkening of the urine, lasting for two days. In the same way cases of intoxication by corrosive sublimate in glycerin have occurred among children treated by the antitoxine, an accident which, whatever the strength of the solution, has never been observed in the many cases previously treated by Moizard.

The Rash in Varicella.

Lorrain (*Annales de Médecine*, 1894, p. 169) publishes a study under this title based upon seventeen collected observations. According to his results, a rash may precede, accompany, or follow the vesicles, but most often precedes them. When it follows an initial eruption of vesicles it often announces another. (Gillet.) This rash develops in a few hours; it is sometimes scarlatiniform, occupying the surfaces of the abdomen, trunk, and lower limbs; at other times morbilliform, and occasionally unites the characteristics of the rashes of both diseases. Fever can be high ($105\frac{4}{5}$° F., in a case reported by Thomas), but angina is always wanting. The rash rarely lasts more than two days, though five days was the duration in a case observed by the author.

The diagnosis is difficult only when the rash precedes the vesicular eruption, and then, perhaps, until sufficient time has elapsed to exclude a variolous type of development in the vesicle.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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Mallein.

Although the "tuberculin" of Koch failed to realize the expectations of those who hoped to find in it a cure for tuberculosis, there could be little doubt that the characteristic febrile reaction induced by it in tuberculous subjects only had a certain scientific if not a very practical value as a means of diagnosis. But no truth can long remain barren, and Kalning, following up the clue, succeeded in a few months in obtaining from artificial cultures of intensified bacilli of glanders a substance which, acting in like manner, detects with almost unerring certainty the presence of that disease, even in those cases of chronic farcy in which deep-seated glands only are implicated and the general health of the animal is apparently unaffected. This reaction, which is independent of and not obscured by any pyrexia already present, whether due to the disease in question or to concurrent febrile processes, is not manifested after injections of mallein in the course of any of those, as tuberculosis, glandular affections, lymphangiomata, sarcomata, catarrh of antrum, pneumonia, etc., which simulate either the acute or chronic forms of glanders or farcy. It is quite characteristic, commencing in four, six, or eight hours after the injection, culminating in ten, twelve, or fourteen, and subsiding between the sixteenth and twentieth, or in some cases not until twenty-four to thirty-six hours. The maximum temperature of 39.5°–40° C. (= 95°–

104° F.) once reached is maintained without oscillations for from six to twelve to eighteen hours, but no rise of less than 1.5° C. (= 2.7° F.) can be considered as more than ground for suspicion.

Drs. Hutyra and Preisz, of Buda, have collected reports of 473 injections performed in Germany, in 260 of which there was no reaction, and in 213 some. In 208 of these post-mortem examinations were made, glanders being found in 199; in the remaining 7 acute pulmonary tuberculosis and pneumonia, with suppuration of the peri-bronchial glands (two cases of each), would account for the pyrexia in four, while in none of the seven was the reaction typical.

A series of 162 experiments performed at Montoise, in France, gave somewhat discordant results, probably through some errors in operation or in observation. For while of 143 horses in which positive effects were obtained, 142 were found to be infected, 12 out of 19 giving "negative or indistinct results" were so too, and 7 only free from disease. Meszaros operated on 37 horses, 8 of which reacted to the extent of 1.9° to 2.9° C. (3.4°–5.2° F.), and all were found glandered. Kopeczky injected 312 horses in a regiment of Hussars, obtaining reactions in 27, in all but one over 1.5° C. (2.7° F.). All were found diseased, though two only looked in any way suspicious, one having a cough and the other a slight glandular swelling in a forefoot.

Schindelke injected 144 horses with Forth's mallein in doses of various strengths, obtaining the following results: In 63 the rise of temperature was from 2° to 3.6° C. (3.6°–6.5 F.), and 62 were found to be diseased. In 63 the rise was 1.3° C. to 1.9° C. (2.3°–3.4° F.), with 36 diseased and 27 healthy. In 14 the rise was only 0.7° to 2° C. (1.2°–3 6° F.), and only 1 infected, while 4 gave no reaction whatever, and all proved to be perfectly sound.

In another classified series of 486 injections, autopsies were made in 126, in which reaction was observed with similar results: of 22 with a rise under 1.5° C. (2.7° F.), 8 were diseased, 13 healthy, and 1 doubtful. Of 15 with a rise between 1.5° and 2° C. (2.7°–3.6° F.), all were diseased, and of 89 in which the rise exceeded 2° C. (3.6° F.) 84 were diseased and 5 not, but the observation in 4 of these was disputed, and the pyrexia in the other was far from typical.

It is thus evident that when a characteristic reaction involving an elevation of 2° C. above the normal is observed, glanders in some form is almost certainly present, and when the rise exceeds 1.5° C. there is a strong presumption, and the animals ought at least to be isolated and kept under the closest observation, while a rise of 1° C. should be looked on as suspicious.

Mallein has not as yet been obtained in a state of chemical purity or even isolated, but is present in very various proportions in different culture fluids. Forth's mallein, which is ten times as strong as some samples, and the dose of which is but 0.01 gr., is thus prepared. The virulence of the bacilli of glanders having been greatly intensified by their being passed through a succession of guinea-pigs, cultures are made on potato between watch-glasses. When these have become perfectly black they are put into flasks and just covered with a solution of equal parts of glycerin and distilled water, with 3 to 5 per cent. of sublimate, and kept for ten to fourteen days in a warm chamber at a temperature of 37.5° C. (99.5° F.). The fluid is then strained through filtering paper and sterilized by an hour's exposure to a steam current.

The filtrate, a dichroic, *i.e.*, brown-green fluid, will remain sterile, and retain its activity for six months at least, though the bottle be opened frequently.

The dose is 0.3 to 0.5 c.cm. diluted to 3 c.cms. with 5 per cent. phenol water. This mixture is very stable, and the mallein may with advantage be sent out in this form.

STAINS FOR AMYLOID.

The iodine-test has always been the most reliable means of detecting amyloid degeneration in tissues, but its delicacy is often obscured by the color which is imparted to the normal tissues by the iodine, particularly when the degenerated areas are small or the sections are thick. To overcome this difficulty slight modification of the usual method has been suggested by GALEOTTI (*Centralbl. f. Allg. Path. u. Path. Anat.*, 1894, No. 7). Sections of the alcohol-hardened tissues, thoroughly washed in water to remove all alcohol, are immersed for twenty minutes to half an hour in a 5 per cent. solution of potassium iodide, are then rather quickly washed in water, after which they are transferred to chlorine water. The chlorine replaces the iodine in the salt and the iodine is liberated, staining the amyloid of a deep mahogany-brown, while the tissues remain almost colorless. Finally, the sections are again washed in water and are preserved in glycerin.

Thionin has recently been recommended by KANTOROWICZ (*Centralbl. f. Allg. Path. u. Path. Anat.*, 1894, No. 3) as a delicate stain for amyloid. The sections are immersed in a saturated acqueous solution for from three to five minutes, are washed and dehydrated in alcohol, cleared in anilin-oil-xylol, and mounted in balsam. The amyloid areas are lilac, the tissues blue. Mucin stains red by this method.

ERRATUM.—Vol. CIX., No. 1, page 80, eighth line from bottom, for *mercuric* read *meconic*.

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THE

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THE "DISPERSIBLE" TUMORS OF THE FEMALE BREAST; WITH CASES.[1]

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A VERY common question by hospital patients who apply with a "lump in the breast" is: "Whether this cannot be dispersed?" While it is needless to remark that such an aim is utterly impossible in the case of a cancerous growth, or that should we vainly essay for the latter merely tentative treatment, we shall only succeed in frittering away what may yet remain of the six or eight weeks period, within which alone modern surgery can reasonably guarantee a radical cure, yet I should like now to point out that a margin of instances numerically considerable yet exists, wherein recourse to the operator's knife is hardly ever necessary, and in which "dispersal" can be effected with no great difficulty.

Foremost of the latter is the tumor described in my works, by way of distinguishing it from the connective-tissue mammary growths of later life, as the "fibroma of adolescence." This is found only in the evolutionary period of the mamma, *i. e.*, from fourteen to twenty-five years of age. A young girl who wears a tight corset appears with the "lump" aforesaid, varying in degree from a scarcely perceptible thickening of the breast-tissue to a distinct, rounded, rather nodular tumor as large as a walnut. Often several of those are present, and both breasts are affected. The pain complained of varies greatly with the emotional tendencies of the girl; and also (in no small degree) with her frequent resort to tea-drinking. Commonly it exhibits an inverse ratio to the palpable magnitude of the tumor; it is always worst at the menstrual periods. Such growths are the necessary result of obstructed mammary development in early youth, and, so far as I am aware, occur only in a state of civilization. From the huge connective-tissue growths which appear during the decline and devolution of the mammary gland, *i. e.*, after the age of thirty-four, the "fibroma of adolescence" differs in not becoming associated with cyst-formation, an invariable sequel to the adeno-fibroma or cystic fibroma of middle age. The former generally yields to suitable management of hygienic and medicinal character; the latter is never cured, or even arrested, without a surgical operation.

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[1] A paper read in the Section of Surgery at the Bristol meeting of the British Medical Association, 1891.

The old rule *sublata causa, tollitur effectus*, while not absolute, yet has considerable significance in the case of an organ which, like the youthful mamma, has not yet completed its growth. The aberration of nutrition which produces these small fibrous hypertrophies of the breast-stroma appears largely due to direct pressure, but something must also be ascribed to indirect pressure-effects and to sympathy with the uterus, also struggling for unimpeded development. Moderate the injunctions of fashion in the matter of stays, tranquillize the nervous system, abolish tea, order some absorbent ointment, with *frequent* local friction, and the "lump" will vanish within a few weeks, seldom more than six. The application I generally prescribe is as follows: Pulv. plumbi iodidi, ʒj; lanoline, ʒvj; adipis ad, ℥j. This to be well rubbed in four times daily. Occasionally I have varied this with an ointment of green mercuric iodide, twenty grains to the ounce, employed night and morning; or have substituted two drachms of the (British Pharmacopœia) red iodide ointment for the same quantity of unguent. plumbi iodidi. With this, fifteen grains of bromide of potassium are taken internally at bedtime, to subdue the always present neurosis. Proceeding on this method, I have not found it necessary to subject any such case to operation since 1889 (*i. e.*, the patient being a young girl); and then surgical measures were resorted to only in consequence of the individual's impatience. To scar the mamma with multiple scars is a practice meriting emphatic condemnation, and even such an operation as Thomas's, designed to preclude subsequent marking, is hardly ever necessary. The following are cases in point, samples of many similar:

CASE I.—Ada N., aged twenty-four years, single, seen July 17, 1893. At the upper part of the left breast an induration of the parenchyma forming a flattened nodular tumor one inch in diameter. After a single week's employment of the unguent. plumbi iodidi, with lanoline, there was only a slight trace of the "lump."

CASE II.—Patty D., aged twenty-three years, single, seen January 15, 1894. To outer side of left nipple, flattened and indurated breast-tissue, constituting a "lump" one-half inch in diameter, one year's duration; conspicuously tight stays. On the 22d nothing abnormal could be felt.

Case III.—Annie E., aged twenty years, single, domestic servant. Mamma large; ill-defined hypertrophic induration of outer half of left breast, of four years' duration. Treatment from October 28, 1889, till November 25th, then no tumor and nothing abnormal could be found.

Case IV.—Louisa Emily M., aged twenty-three years, single, shop-woman; out-patient April 28, 1890. At lower border of left breast a tumor the size of a hazelnut; noticed three years. Attendance till August 11th; then "perfectly cured." Has since married and borne two children; writes (December, 1893) to say she has had no further trouble.

Case V.—Annie J., aged thirty-seven years, single; out-patient June 11, 1888. At the upper part of the left breast was a tumor of at least several years' duration, equal in size to a large walnut. Operation had been recommended by a cancer specialist. Under inunction by the lead iodide ointment thrice daily entire disappearance of the "lump" in seven weeks. Seen two years afterward; no further breast trouble.

Case VI.—Ellen O'K., aged thirty years, married, no children; out-patient January 19, 1891. Hard nodule the size of a pea to outer side of each breast; left largest. Intermittent attendance (from Colchester) for several weeks. On June 1st no trace of either perceptible.

Case VII.—Amelia B., aged twenty-four years, single. Nodule the size of a large pea deep in gland-tissue of left breast. Attendance from April 4 to May 21, 1887. Use of the iodide ointment thrice daily, with entire resolution.

Case VIII.—Rose N., aged eighteen years, single. A tumor as large as a walnut, lobulated, at pectoral margin of left mamma, noticed eight months. Out-patient May 2, 1887; treatment until July 11th, then lost sight of. In December, 1893, states in reply to inquiry, that some enlargement persists, but that all inconvenience has ceased, and that she has never required any further treatment.

Case IX.—Emma H., aged nineteen years, single. At the age of fourteen a tumor as large as an egg stated to have been removed from left breast; now scar three inches long at lower border. External to this, movable tumor size of hazelnut. Attendance from October 3 to November 14, 1889. Seen on January 8, 1894, when no trace was to be felt.

Case X.—Fanny S., aged twenty-four years, single. Induration of parenchyma at outer part of left breast, noticed eighteen months. Treated from November 8, 1886, to February 14, 1887, with complete resolution.

Case XI.—Marie W., aged twenty-eight years. At upper and outer part of left breast the tissue was hard and nodular, forming a flattened tumor one inch in diameter; noticed two months. A neurotic girl with the usual tight stays. Treated from January 2 till March 19, 1894, when only a faint trace of the induration remained. At first the lead iodide with two drachms of red mercuric oxide ointment; subsequently the former with fifteen grains of alcoholic extract of belladonna to the ounce.

The preceding would appear to have been examples of the true "fibroma of adolescence" occurring in young girls, with no obvious cause other than tight stays and a neurotic habit. At a later period small indurated tumors, which cannot be regarded as due to arrested or perverted development and which commonly own an inflammatory origin, are met with. These similarly yield to local treatment.

Case XII.—Jane H., aged forty-four years, married, no children. Out-patient August 26, 1876. In the left breast an irregularly nodulated, moderately hard induration of the parenchyma, noticed six years. Lancinating pain was described, but was referred also to the opposite breast, in which was another "lump" rather smaller. Although the age was so suspicious, a diagnosis of non-malignancy was founded on the duration of the case and the simultaneous affection of both mammæ. Under the inunction four times daily of ung. plumbi iodidi, the condition wholly vanished in about eight weeks. On November 8, 1887, the date of the last recorded attendance, no trace of tumor was perceptible.

Case XIII.—Louisa P., aged thirty-four years, married, three children. Ill-defined indurated "lump" in left breast following blow three months previously. Inunction four times daily of ung. plumbi iodidi. Attendance from September 12 till December 19, 1879. Gradual resolution; on latter date nothing abnormal to be felt.

Case XIV.—Emma H., aged thirty-six years, married, four children. Softish movable "lump" at upper part of left breast, noticed three months; in right breast another smaller. A history of cancer in the family. By October 17th both tumors had all but entirely disappeared.

Case XV.—Eliza R., aged thirty-eight years, widow. A hard ill-defined tumor at upper part of right breast noticed two years. Treatment as usual from September 24, 1880, until January 7, 1881; then complete resolution, leaving no trace of abnormality.

Case XVI.—Fanny S., married, one child two years of age. Blow from child seven months previously. Deep in left breast a tumor the size of a walnut, freely movable. Treatment from December 1, 1882, until March 2, 1883, then no trace perceptible.

Case XVII.—Elizabeth B., aged thirty-seven years, married, no children. In left breast hard nodule, size of large pea, noticed two years. Treated with unguent. hydrarg. iodidi viridis, night and morning, from January 25 till February 15, 1884, with perfect resolution.

Case XVIII.—Emily W., aged thirty-seven years, married, one child one year of age, not nursed. Tumor, size of walnut, noticed six months, movable, at upper part of left breast. Treatment as usual till February 23d, then nothing abnormal.

Case XIX.—Mary D., aged twenty seven years, single. Out-patient November 19, 1888. Blow two months. Marked induration at outer part of left breast; great pain. On November 26th nothing to be felt.

Case XX.—Emma B., aged thirty-four years, single. Seen June 17, 1889. In left breast a nodule size of hazelnut, flattened, not hard, movable, noticed four days. On June 24th no tumor discernible.

Case XXI.—Martha P., aged forty-six years, married, no children. On July 6, 1885, a tumor the size of a small orange, movable, elastic, at upper part of left breast. Duration one year. Attendance till July 20th, then tumor much smaller. Not seen again, but writes (December, 1893) to say she has had no more trouble.

Case XXII.—Eliza B., aged thirty-seven years, married, two children, youngest eight years of age. Small lobulated tumor at lower edge of left breast, noticed six weeks. Occasional lancinating pain for several years. Treated from September 12 till October 17, 1892. Complete disappearance of "lump."

Case XXIII.—Mary L. P., aged thirty years, single. Blow eighteen months; pricking pain a fortnight. Tumor the size of large bean at upper part of right breast. Treated from November 6, 1893, till December 4th, then only a trace remained.

The following is a somewhat analogous instance of irritative hyperplasia in the youthful male breast.

Case XXIV.—Mr. H., aged twenty-two years, sent for consultation in May, 1891, by Dr. McElfatrick, of Mere. Irregularly lobulated induration of left breast, forming a flattened tumor one inch in diameter, noticed two to three months, and apparently caused by slight blows when jumping up to a clerk's high desk. Treated for three weeks with the lead iodide ointment, then for five days with lin. belladonna; complete resolution.

A third class of "dispersible" tumors is afforded by inflammatory conditions in, or cystic dilatation of, lactiferous ducts. And in this may be included small sebaceous cysts of the areola.

Case XXV.—Mrs. F., aged forty-eight years, no children; subject to eczema of the areola. Just below right nipple prominent, very hard red swelling, size of hazelnut, noticed nine days only; no fluctuation. In great consternation, as an operation had just been advised by distinguished gynecologist. Treatment from November 14, 1893, till December 2d. Liniment of iodine locally for a week, then the lead iodide ointment; complete resolution.

Case XXVI.—Frances P., aged thirty-seven years, single. Outpatient December 15, 1882. Small soft tumor, size of large pea, one inch from left nipple. After a single week's treatment only faint trace discoverable; no further attendance.

Case XXVII.—Jane P., aged twenty-seven years, married, no children. Above right nipple a pea-like nodule, evidently a dilated duct, of fifteen months' duration. Treatment from April 6, 1891, till April 20th, then nothing abnormal found.

Case XXVIII.—Emma W., aged sixty-three years. Sebaceous cyst of areola, blackish in color, size of pea, of two and a half years' duration. Seen October 28, 1889. By November 11th entire resolution.

As already hinted, treatment such as that indicated, if adopted for a malignant tumor, will only waste the precious time available for curative eradication before secondary infection has ensued; and it is of no avail for the cystic benign growths which appear during the devolution of the female breast. A prompt and at the same time careful diagnosis is therefore essential. After the adolescent period (25 years) even simple fibromata yield far less readily than before development is complete; and the earlier after their appearance these are dealt with, the better.

THE BACTERIOLOGY AND PATHOLOGY OF DIPHTHERIA.[1]

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The results of the researches of Loeffler, published at the close of the year 1883, may be said to mark the beginning of the new era in the study of diphtheria. With these researches closed the epoch which must be considered to have been inaugurated with the writings of Bretonneau, which represent the beginning of the scientific history of diphtheria, and to have ended with the cultivation and inoculation experiments of Klebs and his pupil Graham Brown, which led to the discovery although, indeed, not to the isolation of the specific micro-organisms of the disease. This period included the experimental researches of Hallier, Letzerich, Rosenbach, Wood and Formad, and others. The failure of Klebs to obtain in pure culture the bacillus diphtheriæ, which he accurately saw and described in the diphtheritic membrane, illustrates with what difficulties the bacteriologist had to contend before the introduction by Koch of the solid culture media.

Whatever doubts surrounded the first publication of Loeffler regarding the relation to diphtheria of the micro-organism which now bears his name, have now been finally dissipated. The isolation of the Loeffler bacillus, by workers in different parts of the world, from the local lesions of the disease in many thousands of cases would seem to afford irrefutable evidence of the constancy of the relationship existing between the bacillus and the pathological process. Hence it is that attention has been directed to a consideration of other aspects of the subject, that of the presence or absence of the Loeffler bacillus in primary diphtheria.

The wide divergence of opinions regarding diphtheria which existed prior to the discovery of the bacillus diphtheriæ illustrates with what difficulty every advance in the study of a disease is accompanied so long as its etiological factor is unknown. It had long been a well-established fact that by a variety of agents pseudo-membranes, which offered more or less the appearances seen in diphtheria, could be produced upon mucous surfaces in man and in animals, but it was at the same time recognized that none of these agents could reproduce the symptom-complex of diphtheria; and none of us is likely to forget the almost interminable discussion which arose as to whether it was primarily a local or a constitutional disease. Nor did the study of its pathology give much assistance in the solution of this question, and only after the specific micro-organisms had been obtained in pure culture did it become possible, by a study of its properties outside the body and of its occurrence under natural conditions in human beings, to establish a rational basis for a classification of the disease.

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First of all, then, it is important to distinguish between the anatomical and the etiological significance of the term "diphtheria," and it will be found that a limitation of the term to a disease characterized by the presence of the bacillus diphtheriæ in the affected portions of the body will do much to eliminate the confusion of pathological conditions which, while anatomically resembling one another, are otherwise quite distinct.

I deem it unnecessary to bring before you at this time, in a systematic manner, the bacteriological evidence that the Loeffler bacillus is the sole cause of diphtheria; nor shall I occupy your time with a description of the biologic properties of the organism. The cultures which I pass around will show the manner of the growth of the bacillus upon various culture media, and under the microscope cover-slip preparations can be seen which will exhibit to you its characteristic morphology. I would, however, emphasize the fact that the properties of the Loeffler bacillus are sufficiently characteristic to permit of its recognition under the most diverse circumstances and stamp it as a distinct species.

The first question to which I would direct your attention regards the proportion of cases of pseudo-membranous inflammation of the throat which are due to the Loeffler bacillus. In the first series, reported by Loeffler himself, a certain number of the cases examined did not yield the diphtheritic bacillus; but of these several were recognized as not having been cases of primary diphtheria. This failure to find the Loeffler bacillus in all pseudo-membranous inflammations in the throat and air-passages has been confirmed by later investigators. Thus, in a table prepared by Escherich, in 679 examinations collected from Paris, Berlin, and New York, the bacillus diphtheriæ was found in 427, or in 62 per cent. of all the cases. In a series studied by Morse, of Boston, of 301 cases examined, in 217 was found the Loeffler bacillus—*i. e.*, it was present in 72 per cent. of the cases. Park and Beebe report that of 5611 cases examined, positive results were obtained in 3255 (58 per cent.). The bacillus was absent in 1540 cases (27 per cent.), while 816 cases were doubtful. The doubtful cases represent those in which for some reason or another satisfactory cultures were not supplied. If these, then, be disregarded altogether, although it may not be entirely fair to do this, we find that out of 4795 cases of suspected diphtheria, 68 per cent. were instances of true diphtheria.

It is acknowledged that the pseudo-membranous anginæ which are associated with the acute exanthemata are commonly not caused by the Loeffler bacillus, but are due, in most cases, to the invasion of the streptococcus pyogenes. In a series of bacteriological examinations made by Booker in such cases, the bacillus diphtheriæ was constantly absent, and Escherich, who studied fourteen cases of scarlet fever, states that the Loeffler bacillus is never present in the early days of the disease, but that in several of these cases it was found to be present later on, a fact which he attributes to the imperfect separation of diphtheria and scarlet fever patients in the Munich Hospital, where his studies were carried out. He also found the Loeffler bacillus in certain cases of measles and whooping-cough, and he agrees with other investigators in holding that the acute exanthematous diseases predispose to infection with the bacillus diphtheriæ.

It had been observed by the older clinicians that during epidemics of diphtheria pseudo-membranous inflammations of the throat, in the course of typhoid fever, were more frequent. Morse reports four cases of typhoid fever complicated with diphtheria, of which at least three developed diphtheria after admission to the hospital.

A purely local and perhaps non-contagious inflammation of the larynx has, by the bacteriological examination of a considerable number of cases of membranous croup, been shown to occur unassociated with diphtheria. These cases, however, are quite exceptional. Of 88 cases of membranous croup studied by Martin, 59, or 67 per cent., were of diphtheritic origin. The statistics of Park indicate that in New York fully 80 per cent. of the cases of the same disease are caused by the Loeffler bacillus. Of 229 of Park's cases, in 167 no membrane or exudate was found above the larynx. Welch and Abbott, Booker, Williams, Kalisko and Paltauf, Concietti and Fraenkel have reported cases of laryngeal diphtheria in which the pseudo-membrane was confined to the larynx and lower air-passages.

The rare and interesting case of ascending croup, in which the membrane begins in the deeper portions of the air passages and extends upward, have been little studied. From the lungs of one such case Martin cultivated the Loeffler bacillus in large numbers.

It is an undoubted fact that a case of so-called membranous laryngitis has not infrequently been the first of a series of cases of genuine faucial diphtheria.

Among the most important results of the bacteriological study of the inflammations of the throat and air-passages has been the discovery that cases which present the features of a mild catarrhal angina or of a lacunar tonsillitis may be associated with the presence of the bacillus diphtheriæ, and that from these can arise other cases in which membrane is found on the fauces. This class of cases has been studied by Escherich and Feer, and especially by Koplik. Within the past few weeks I have seen two such instances in the practice of Dr. W. D. Booker, and from them obtained the Loeffler bacilli in cultures. The first was a girl of sixteen years, who came to the surgical dispensary of the Johns Hopkins Hospital for enlarged glands of the neck. Upon examination she was found to have a lacunar tonsillitis. She suffered no inconvenience other than that resulting from the swollen glands. The plugs from the crypts of the tonsils contained the Loeffler bacillus. She made a rapid recovery.

The second was a child one and a half years of age, whose tonsils were greatly swollen and almost meeting in the middle line of the throat. There was no visible membrane. Cultures from the throat showed the presence of the bacillus diphtheriæ. The local treatment recommended by Loeffler was used, and by the third day all symptoms of the disease had disappeared.

Heubner has just published a short series of cases, in which he calls attention to what he describes under the title of latent diphtheria. These were secondary to other diseases than scarlet fever and measles, and occurred in the young in the course of wasting affections, such as rickets, tuberculosis, etc., in hospital practice. The symptoms were fever, gastro-intestinal disturbances, and slight bronchial and nasal catarrh. Heubner says that diphtheritic infection is not apt to be suspected in these cases until laryngeal stenosis suddenly develops or the fact is revealed at autopsy by the finding of a false membrane in the pharynx or larynx.

Roux and Martin have found in the course of their inoculation experiments for the preparation of the antitoxin that animals which had been previously inoculated with other bacteria or their poisons, from which they had recovered, were more susceptible to the diphtheria toxin; and, similarly, that pregnant animals or such as had just given birth to young, exhibited a similar diminution of resistance.

The mucous membrane of the nose affords a favorite resting place for the Loeffler bacillus. In pharyngeal diphtheria these bacilli are commonly present in the nasal secretions, even in the absence of membrane in the nose. Primary diphtheria of the nasal mucous membrane sometimes occurs. First observed by Baginsky, additional instances have been reported by Abbott, Abel, Ravenel, Czemetschka, and Felsenthal. Townsend reports 5 and Park 10 cases of fibrinous rhinitis, in which the membrane was confined to the nose in 4 and 9 cases respectively. Katz has just recorded an instance of faucial diphtheria, the infection in which was traced to a case of diphtheritic fibrinous rhinitis. Similar results have attended the bacteriological examination of other investigators, and Escherich has seen one case in which the infection of the nasal mucous membrane took place through the tear duct in a case of diphtheritic conjunctivitis.

Babes first cultivated the Loeffler bacillus from the pseudo-membrane in diphtheritic conjunctivitis, and reproduced the disease by the inoculation of the organism upon the conjunctiva of rabbits. A number of cases of pseudo-membranous conjunctivitis have since been found to be associated with the bacillus diphtheriæ, although it must be stated that not all are caused by this organism. In two cases which I examined for Dr. Hiram Woods the Loeffler bacillus was not found in the exudate, but streptococci were present in both. The results of Councilman's investigations would go to show that certain cases of otitis media are due to the bacillus diphtheriæ. He found this organism in the pus from the middle ear of a patient who had diphtheria, and in two cases in measles without diphtheria of the throat.

The skin surfaces of the body would appear to be immune to the action of the Loeffler bacillus in the absence of any loss of continuity. Thus Wright cultivated the diphtheria bacillus from excoriated or ulcerated surfaces of the skin in seven cases of diphtheria; and Park found this organism in wounds of the finger received by physicians while performing intubation. Cases of wound diphtheria associated with the Loeffler bacillus are reported by Neisser, Treitel, and Abel; but it is probable that most cases of so called wound diphtheria are caused by other micro-organisms. The relative insusceptibility of the external surfaces of the body to infection with the bacillus diphtheriæ is illustrated by the behavior of tracheotomy wounds, which only exceptionally become infected with this organism. Foltanek examined 953 tracheotomy wounds without succeeding in a single instance in isolating the Loeffler bacillus. Other observers have been more successful, but in these cases the possibility of the contamination of the wounded surfaces with the tracheal secretion cannot be excluded.

Having now passed in rapid review the situations of common localization of the Loeffler bacillus upon the surface and in the cavities of the body, I would ask your attention to its distribution within the viscera. At the time of Loeffler's first publication he expressed a belief that the bacillus diphtheriæ was to be found only at the local site of the disease, and that it did not invade the tissues at all, or at least only exceptionally. He had cultivated it, however, in one case from the lungs, and later Kolisko and Paltauf and Babes isolated in rare instances a few organisms from the internal organs. The observations of Frosch, since confirmed by others, have shown that not uncommonly a few bacilli enter the circulation and may be cultivated from the internal organs at autopsy. They are not, however, only small in number, but their distribution is irregular, and it is necessary to transplant considerable quantities of material in order to grow them. Frosch cultivated the bacillus from the blood of the heart, the brain, pleural and pericardial exudates, pneumonic areas in the lungs, spleen, kidneys, bronchial and cervical lymph glands, and liver. Booker has also obtained the organism from the internal organs. At the autopsy of a child of three years, which had both pharyngeal and laryngeal diphtheria, I obtained the bacilli diphtheriæ in pure culture from the heart's blood, cervical lymph glands, liver, spleen, lungs, and kidneys; but, contrary to Frosch's experience, they were present, in this case, in large numbers in the blood, glands, and spleen. In this, as well as in a later instance, I was able to cultivate the Loeffler bacilli from broncho-pneumonic areas, and also to demonstrate them in sections from the bronchi and lung tissue. The predominating organism, however, was the micrococcus lanceolatus. Kutscher has just shown that the Loeffler bacillus exists at times in considerable numbers and may be the predominating organism in cases of broncho-pneumonia associated with diphtheria, and he inclines to the view that it is capable of causing both bronchitis and consolidation of the lung substance. Wright has found the bacillus diphtheriæ in the internal organs in cases of human diphtheria, and he has also cultivated them from the liver, spleen, heart's blood, and kidneys, in a small number of experimental guinea pigs. Abbott and Ghriskey found that after inoculating cultures of diphtheria bacilli into the testicle of guinea-pigs small nodules containing this organism sometimes appeared in the omentuum, and this bacillus has also been cultivated from the ecchymotic patches in the stomach and from the surface of the membrane in croupous gastritis. Of special interest is the case reported by Howard, in which a bacillus in all respects resembling the bacillus diphtheriæ, except that it did not possess pathogenic powers for guinea-pigs, was cultivated in large numbers from the heart valves in a case of acute ulcerative endocarditis, and from the infarctions in the spleen and kidneys.

Notwithstanding the results of later and more searching studies which have necessitated a modification of the earlier views regarding the relation of the Loeffler bacillus to diphtheria, and notwithstanding the fact that it is now known that the Loeffler bacillus can develop not only locally upon the affected mucous membrane, it must be considered as proven that only a few organisms penetrate into the body; and there are undoubted instances in which the disease has pursued a typical, severe, and even fatal course in which the bacilli have remained localized in the mucous membrane. Hence the local process is still to be regarded as the chief seat of the activity of the bacillus diphtheriæ.

The study of the properties of this bacillus as it exists outside the human body, and the results derived from the inoculation of susceptible animals, would indicate that the effects which it produces upon the body are due to a soluble poison, a toxin, proceeding from its growth and multiplication. By means of this toxin, separated from the living bacilli, all the constitutional effects of diphtheria can be induced. For the production of the false membrane the presence of the bacillus itself is necessary.

The growth and multiplication of the bacilli in the false membrane in the pharynx, larynx, and nose are associated with the formation of this toxin, which entering the body causes the symptom-complex of the disease. Sidney Martin has extracted from the pseudo-membrane an albumose which possesses the poisonous properties of the toxin.

We owe especially to Roux and Yersin, and Brieger and Fraenkel, our knowledge of the nature and properties of this toxin. According to their researches, it belongs to a class of substances of albuminous nature, possessing poisonous properties, for which the name tox-albumins has been proposed. Up to the present time the tox-albumin of diphtheria has not been obtained in a pure form, but in its impure state it is found to possess extraordinary potency. Susceptible animals (rabbits, guinea-pigs, kittens) inoculated with it exhibit all the symptoms of diphtheria, not excepting the post-diphtheritic paralysis.

The study of the action of this bacillus upon animals has shown a material difference in the virulence exhibited by cultures derived from different colonies. The guinea-pig, being the animal most susceptible to its influence, is generally employed for testing these variations.

A small dose of a virulent culture introduced subcutaneously will kill a guinea-pig in from forty-eight to seventy two hours, and an equal quantity of a somewhat less powerful culture will cause death in from four to six days. The animals show at the seat of inoculation a local membrane which contains the bacilli and a more or less widely spreading œdema of the subcutaneous tissue. The bacilli can be recovered from the seat of inoculation. Weaker cultures may take one, two, or three weeks to bring about a fatal result, and there are still others which produce only a local reaction at the points of inoculation, from which the animal recovers. Different colonies of bacilli obtained from one case may exhibit these wide variations in virulence.

No less striking are the differences in the potency of the toxin produced by the bacillus, and it has been found that there exists a direct relation between the virulence of the organism and the intensity of the poison which it is capable of yielding.

It cannot be said that any such relation between the virulence of the organism and the severity of the symptoms has been shown to exist for human beings. Indeed, contrary to the results arrived at by Roux and Yersin, which seemed to indicate that a progressive diminution in the virulence of the bacilli corresponding with the mildness of the attack took place, and that the same thing happened during convalescence from a severe attack. Escherich, Tobiesen, and especially Wright, have shown that no such diminution of virulence occurs. Fully as virulent organisms may be found in cases which are mild from a clinical standpoint as in those of severer grade.

The questions of individual predisposition or of resistance to the invasion of the bacillus diphtheriæ and to the effects of its toxic products have therefore to be considered in this as in the case of other infectious diseases. What the physical basis for this distinction really is we are probably still far from having discovered. A few of the conditions which favor or inhibit infection in human beings and in animals seem clear. Hence it is that the results of the recent studies of Wasserman and Abel upon the action of the blood-serum of healthy human beings upon animals previously inoculated with the Loeffler bacillus are suggestive, as they indicate that the serum of certain individuals contains some protecting substance, the power possessed by the serum of adults being greater than that of children.

It is quite established that the bacillus diphtheriæ may possess all grades of virulence down to complete absence of pathogenic power, and some confusion has arisen by the introduction of the term "pseudo-diphtheritic" bacillus to denominate an organism which, while it resembles the true bacillus diphtheriæ, is devoid of virulence for guinea-pigs. This bacillus was first isolated by Hoffmann, who regarded it as identical with Loeffler's bacillus. Roux and Yersin advanced the view that this so-called "pseudo-diphtheritic" bacillus represents an attenuated form of the true bacillus diphtheriæ, and the work of Abbott, Park, Koplik, and Escherich lend support to this position. On the other hand, it is suggested that the name "pseudo-diphtheritic" should be reserved to designate bacilli which, though resembling the true diphtheritic bacillus, show certain cultural differences and are devoid of pathogenic effect for guinea-pigs. Such a pseudo diphtheritic bacillus has been found in a few cases of genuine diphtheria associated with the true bacillus diphtheriæ.

It must be confessed that our knowledge of the relation of the Loeffler bacillus to diphtheria and associated pathological processes has been much extended in the past few years. Thus this organism has been found in a large proportion of all cases of pseudo-membranous inflammation of the throat, and is the probable causative agent in all cases of true diphtheria. Those pseudo-membranous anginæ in which the Loeffler bacillus is not found are characterized in themselves and distinguished from cases of true diphtheria by the mildness of their course, their slightly contagious character, and their low mortality; in Park's statistics, excluding those associated with scarlet fever, the death-rate was 1.7 per cent.

That virulent diphtheria bacilli may be present upon the mucous membrane of the pharynx without giving rise to false membrane is proved by those cases of pure laryngeal diphtheria from which the bacilli have been cultivated from the pharynx. Loeffler found in the throat of a healthy child a bacillus which was identical with the true bacillus diphtheriæ; later Hoffmann, Fraenkel, and Feer found it under similar circumstances. In 330 healthy persons examined by Park and

Beebe, who gave no history of contact with diphtheria, they found the non-virulent organisms in twenty-four, virulent bacilli in eight, and pseudo-diphtheritic bacilli in twenty-seven. The examination included for the most part children. Of the eight cases in which virulent bacilli were found, five were children in an asylum where from time to time true diphtheria occurred. Of the remaining three, one was from a house where a supposed case of croup had existed three weeks before. Two of the eight children developed diphtheria some days later; the other six remained healthy. Loeffler recently examined the throats of sixty school-children, and found diphtheria bacilli in four. Of these, two subsequently developed diphtheria, one a slight inflammation of the throat, the fourth remaining well.

The study by Park of the throats of persons exposed to diphtheria has shown that in 50 per cent. virulent Loeffler's bacilli are present. Of these, 40 per cent. developed later the lesions of the disease. Park states that in the families from which his statistics covering this point were obtained the conditions for the transmission of the disease were most favorable. On the other hand, in families where the patient suffering from diphtheria had been well isolated, the bacilli were found in less than 10 per cent. of the healthy children.

Considered in the light of our present knowledge of the common existence of pathogenic micro organisms, such as streptococci, staphylococci, and pneumococci, in the mouths of healthy persons, without necessarily doing harm there, these facts of the occasional occurrence of virulent diphtheria bacilli in the throats of healthy persons are less surprising. Doubtless it is necessary that a certain susceptibility to their action, a predisposition, if you prefer, must exist, before their peculiar effects can be exerted. I beg to recall in this place the experimental results obtained from healthy human blood serum as bearing upon this point. However, the figures furnished by Park and Loeffler would indicate that the presence of the bacillus diphtheriæ in the throat is far more significant even for the individual himself, to leave out of consideration for a moment those with whom he may come in contact, than are the other pathogenic organisms mentioned.

The bacteriological study of convalescent cases shows that virulent bacilli may persist for a time after the disappearance of the false membrane. They are not uncommonly present after two to three weeks, and in a few instances they have been found after a much longer period. In a case reported by Park and one also by Abel they were still demonstrable on the fifty-sixth and sixty-fifth day respectively after the membrane had entirely gone.

The severity of the case has no influence upon the duration of the presence of the bacilli; the occurrence of nasal diphtheria as a complication seems to favor this persistence. Tezenas found in twelve cases complicated with nasal diphtheria that for a long time after the membrane had disappeared a serous exudation from the nose continued. In ten of these cases Loeffler bacilli were demonstrable so long as the secretion persisted, although they had long ceased to be present in the throat. Hence, where cultures cannot be made it is recommended to continue the isolation of the patients for at least three weeks after the disappearance of the membrane.

It is probable that the bacillus diphtheriæ is capable of increasing only within the body of infected persons or in the seat of inoculation of susceptible animals. The bacilli are, however, able to remain alive and in a condition capable of causing infection for a considerable time when outside the body. Conditions which promote the drying of the organism and exposure to strong light are unfavorable for the preservation of its vitality. The individual Loeffler bacilli quickly die when allowed to become air-dry. But in bits of mucus or membrane, particularly if protected from the light and preserved in a damp place, they may remain alive for a long time—upon old cultures from five to fifteen months; in bits of membrane from four to seventeen weeks. They have been cultivated from tableware and toys; from soiled linen which had been in contact with the sick; from the shoes and hair of nurses, and from the broom used to sweep the floor of a diphtheria ward. In view of these facts it is unnecessary to point out the importance of thorough disinfection and of the rigorous care that should be observed in disposing of the excreta of the sick.

The so-called diphtheritic affections of domestic animals are, perhaps, not to be feared as a source of infection for human beings, as the same micro organism is not concerned in their causation. It is, however, not excluded that domestic animals may carry the infection of true diphtheria from one place to another, without themselves exhibiting symptoms of the disease. At the present time it is not possible to make any positive statements regarding the diphtheria of cats.

The association of other micro-organisms with the bacillus diphtheriæ in the false membrane is by no means uncommon, although cases of pure diphtheritic pseudo-membranous inflammation are known to exist. The organisms usually associated with the Loeffler bacillus are the pyogenic cocci, strepto-, staphylo- and diplococci. Their presence is now known to be of great clinical and pathological significance, especially if they enter the deeper tissues as they are wont to do. While the bacillus diphtheriæ is found only exceptionally in the adjacent lymph-glands and internal organs, there exists a group of cases of poly-infection, especially with streptococci, in which the latter enter the circulation and invade the organs. Since the introduction of the antitoxin-treatment of diphtheria this class of cases has attracted especial attention.

These cases had been recognized and studied by a number of investigators, and in this country especially by Councilman and his associates. Broncho-pneumonia, suppuration of lymph glands, and septic forms of diphtheria are attributed to these associated bacteria, particularly to the streptococcus. Roux and Yersin first pointed out the importance of this poly-infection, and subsequently Schreider, Mya, Barbier, and Martin confirmed their observations. Funk, Roux and Martin, and Bernheim have recently made careful experimental studies on this subject. The latter employed only organisms which had been associated in the diphtheritic membrane, and he found that the virulence of the Loeffler bacillus is increased both by being grown with the streptococcus and in the filtrate obtained from streptococcus cultures. A limited number of experiments with staphylococci did not show a similar increase in the virulence of the bacillus diphtheriæ, a result confirmatory of Mya's earlier experiments. On the other hand, in human beings, according to Morse's statistics, cases of poly-infection with staphylococci run a more unfavorable course than those with streptococci. Welch has criticised his conclusions and shown the improbability of their correctness.

I am admonished by the little time which remains to me to be brief, and all the more because the Association is to have from another source a paper on the antitoxin-treatment of diphtheria. The great central point toward which the previous work outlined in this paper all tends has been the discovery of a rational and successful therapy. The culmination seems near at hand.

The natural variation in virulence of the bacillus diphtheriæ led first unintentionally, and later purposely, to the rendering of animals immune to subsequent inoculation with the Loeffler bacillus. But it was soon observed that this method of securing immunity was capricious and unreliable. The use of cultures of bacilli attenuated by chemical agents, the injection of tissue fluids of an animal dead of a previous inoculation of the bacilli into another, the employment of sterilized bouillon cultures and of cultures grown in infusions of cellular organs, such as the thymus gland, while attended with success in some cases, were found to be precarious methods of securing immunity, and not at all adapted to large animals. The use of a virus obtained from bouillon cultures several weeks old by filtration has been successfully employed by Behring Ehrlich and Wassermann, Roux, and others, to render even large animals, such as the horse, immune to large doses of diphtheria cultures. And one of the surprising and significant facts which have resulted from the study of the changes induced in the body fluids of the immune animal consists in the discovery that they contain a substance which is capable of rendering other animals and even human beings immune from diphtheria and also of curing the disease after its development.

This antitoxin obtained from the blood of immune animals, though antidotal to the poison of the bacillus diphtheriæ, exerts no power over the poison produced by the bacteria associated with the Loeffler bacillus in the pseudo-membrane, and thus it becomes clear why cases of poly-infection are less influenced by the antitoxin-treatment than those of pure diphtheria.

It is but a confirmation of an intuitive belief to find that in the blood of human beings well of diphtheria there exists a body similar to that found in immune animals. The experiments of Klemenciwicz and Escherich proved the correctness of this supposition, and Abel has just furnished a larger series of observations with confirmatory results. In animals a certain time elapses after the inoculation of the toxin before the antitoxin appears, and it is only after repeated doses at intervals that a high grade of antitoxic power is developed in the blood-serum. In human beings the blood taken on the fifth or sixth day after infection shows no protective action, the protective power appears from the eighth to the eleventh day, and it persists a variable time. Sometimes it fails to appear at all. After some months it may be still present, though in a diminished degree, or it may have entirely disappeared. The longest periods of persistence yet observed are one hundred and fifty and two hundred days.

These facts bear out the experience of physicians who have noted that diphtheria is not one of those diseases one attack of which affords protection from subsequent infection. Perhaps the individual differences observed are to be explained by the variation in the amount of healing and protecting substance formed in any case.

The time which I have consumed in dealing with the bacteriological aspects of my subject leave me little opportunity to treat of the pathology of diphtheria. I shall not weary you with a minute account of the pathological changes which are found in this disease. With the appearance of the pseudo-membrane you are all familiar, and I have already pointed out that in many atypical cases only a bacteriological study can decide the true nature of the case. In a case of genuine diphtheria the Loeffler bacilli are found in great numbers in the pseudo-membrane, there being less in the deeper than in the older and more superficial parts; they are also found on the adjacent mucous membrane. A lesion of the surface provides a condition favorable to their settlement and increase, a fact also borne out by experiments on susceptible animals. Where no previous defect exists it is probable that the toxin itself can cause a superficial lesion. The tonsils, which are the starting-points of many cases of diphtheria, afford an excellent nidus for the bacilli on account of the incompleteness of their epithelial covering even in health. The depth and extent of the necrosis of the mucous membrane vary in different cases, and the character of the pseudo-membrane is affected by the nature of the underlying structures; in the pharynx it is firmer and less easily separable than in the larynx and trachea, where a distinct basement membrane is found in the mucosa.

The earlier workers in the field of experimental diphtheria failed to find in the internal organs the lesions which had been described by Oertel in the tissues in human beings dead of diphtheria. These lesions consist of foci of cell death characterized by extensive destruction and fragmentation of cell nuclei. In such areas of necrosis fibrin may be deposited. Dr. Welch and I confirmed and extended these results of Oertel by experiments upon guinea-pigs, kittens, and rabbits. Subcutaneous inoculation of the cultures of the organism or of the filtrate of a bouillon culture four or five weeks old produces, besides the local lesions peculiar to each, foci of cell death in the adjacent lymph glands and in the lymph glands throughout the body, in the spleen, liver, lungs, heart, muscle, and intestinal mucosa. The kidneys show degenerative changes. When the dose is small and the animal lives several weeks the paralysis which belongs to the disease may develop. This phenomenon, first observed in animals by Roux and Yersin, was noticed among our animals. Interesting changes have been described in the peripheral nerves under these conditions by Sidney Martin. In some cases he observed defects in the myeline sheaths, which stained poorly in osmic acid, while in certain severe cases the sheaths had entirely disappeared. The axis-cylinders were either intact or had undergone granular degeneration and the continuity of some of the fibres had become broken. At times the muscles supplied by these nerves showed signs of fatty degeneration. These changes agree with those found by Gombault Meyer, Leyden, and Arnheim in human beings who had suffered from diphtheritic paralysis.

According to Johannessen,[1] post-diphtheritic paralysis develops in human beings in cases which have pursued a mild course apparently, as well as in those of severer grade. The percentage, however, is higher in epidemics which have been of a severe character; the figures given by Unterholzner being 4 and 17 per cent. respectively. G. Hoppe-Seyler found that paralysis developed in 27 per cent. of cured cases. Mendel has called attention to the common absence of the knee-reflex after diphtheria, which may not return for five to six months, and of great interest are those instances in which five to six weeks after the disease paralysis of the diaphragm intervenes in which a mortality of 50 per cent. has been observed.

Albuminuria is a not infrequent complication of the disease. Thomsen states that it occurred in 21 per cent. of his cases; and Baginsky and Jansen, in both of whose cases the bacteriological diagnosis was made, found it in 46 per cent. of theirs. The figures given by others are: G. Hoppe-Seyler, 61 per cent.; Cadet and Gassicourt, 75 per cent.; Ranke, 85 per cent.; and Unruh, 100 per cent. Hagenbach states that of all cases which come to autopsy 34.6 per cent. show kidney lesions; and Schrakamp found nephritis in 40 per cent., and Cropf in 46.2 per cent. of such cases. In twenty-four cases in which the bacteriological diagnosis had been made, Felsenthal and Bernhard found at autopsy that the cortex of the kidneys was increased, and that the epithelium of the tubules was swollen, vacuolated, necrotic, and disintegrating. The morphological constituents of the urine vary with the symptoms, and, depending upon these, hyaline, epithelial, and fatty-granular casts may be present. In severe cases the urine may be much diminished in amount; but uremia is unusual, and hydrops, which seldom occurs, is, when present, of a mild grade.

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[1] For the statistics of the frequency of the affection of various organs in human diphtheria I am indebted to the recent paper by Seitz entitled Die Fortschritte unserer Kenntnisse über Ursache, Wesen u. Bekämpfung der Diptherie in letzten Decennium. Münchener med. Wochenschrift, 1891, Nos. 50 and 52.

The heart is not uncommonly involved. The affection is, however, usually not of its serous coats, although pericarditis and endocarditis are known to occur. But it is the muscular structure which suffers, and perhaps the nervous mechanism as well. The figures indicating the percentage of cases in which the heart is affected in the course of diphtheria vary from 10 per cent. to 38 per cent. (G. Hoppe Seyler). The histological changes are described as being either of the parenchymatous variety, in severe grades associated with fatty degeneration, or as consisting of an interstitial myocarditis.

The lymphatic glands of the neck, which usually become swollen, show only a slight tendency to suppuration; according to Henoch, suppuration occurs in 2 per cent. of the cases. The spleen is commonly enough somewhat enlarged, but it is only exceptionally found to reach a considerable size. Various complications may develop in the course of the disease, the most frequent being pneumonia; but this is due in the great majority of instances, as doubtless are also the joint affections which occur, to the invasion of secondary micro-organisms.

In conclusion, I have in this paper attempted to show, although necessarily in an incomplete and fragmentary manner, that in the last decade, by the employment of modern methods of research, more light has been thrown upon diphtheria than had been gained in the half century which had elapsed since its description by Bretonneau, and I think that I may safely say that there is no other infectious disease which has been rendered so clear in its etiology and pathology, so amenable to prophylaxis, and in the treatment of which so much is now promised.

RELATION OF INFECTIOUS PROCESSES TO DISEASES OF THE NERVOUS SYSTEM. PATHOLOGY AND ETIOLOGY.

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The subject with which we are concerned[1] may be studied from either of two points of view: that of the bacteriologist, whose interest is rather with the nature and mode of action of the infective agent, or that of the neurologist, whose training has made him more familiar with the laws of reaction of the nervous system. It is with the latter aspects of the subject that this paper will mainly deal. Where bacteriological doctrines and discoveries are utilized I shall try to confine myself within conservative opinions, an intention for which no apology is needed.

The problem before us is the following:

1. To inquire into the pathogenesis of the nervous affections which are obviously of infectious origin.
2. To investigate the claims of the affections which are only suspected to be of infectious origin.
3. To investigate the contributive causes which make certain parts of the nervous system peculiarly liable to suffer from infectious influences.

It is not only and not so much the direct effects of infection which are most to be feared. The prostrating influence of the original struggle, though it may end in the apparent defeat of the infective agent, is liable to search the hidden weaknesses of the nervous system and to lay it at the mercy of morbid agencies with which it would otherwise have been able to cope successfully.

The patients with affections of the nervous system who have come under observation in the Out-Patient Department for Diseases of the Nervous System of the Massachusetts General Hospital, during the last five years, aggregate a little over five thousand; and of these, about five hundred had had, within a year before the onset of the illness for which they presented themselves, some infectious disease which might be suspected to have been at least a partial cause. About 80 per cent. of these affections were post-influenzal and post-syphilitic (even excluding the cases of paretic dementia and ataxic tabes with a syphilitic history, which numbered respectively 29 and 71); the rest, in order of frequency, were cases preceded by diphtheria (53), typhoid (47), scarlatina (14), malaria (13), measles (9), gonorrhœa (8).

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[1] This paper was read in abstract at the meeting of the Congress of American Physicians and Surgeons, June, 1894, but a number of changes and additions have been made since then. It is intended rather as a summary of the work of others than as a report of original research.

It is pre-eminently the duty of the neurologist, in analyzing a given case, or a series of cases such as this, to consider, first of all, to what extent the results could be explained without referring them to the direct action of the infective agent.

To do this fairly would require an intimate acquaintance with many influences, of which the following are the chief:

I. The nervous system has certain natural proclivities to certain forms of disease in the production of which the infectious process only joins hands with developmental or inherited tendencies, or accentuates the habitual strains of life [laws of "devolution" (Jackson); laws of "degeneration;" disproportion between waste and repair (Edinger)]. Our knowledge of these tendencies is still far from complete.

It is not only the typical psychoses and neuroses which can arise in this way. There are indications that some of the acute and chronic degenerative affections, such as symmetrical polyneuritis, with its striking peculiarities of distribution, and the different forms of tabes, may be shown to mark some of the natural lines of fracture or cleavage exhibited by the nervous system when subjected to strain.

It must not, however, be forgotten that these factors seem to be called out more strongly by certain infectious processes than by others, and made to operate in more or less definite ways, so that, clinically, the connection between the infection and the final disease, though indirect, may be a tolerably close and systematic one.

II. The infectious processes may give rise to secondary disorders of nutrition, of cardiac, vascular, digestive, sclerotic, and metabolic origin, and a primary infection is liable to become complicated at any part of its course by a secondary infection with its own train of consequences.

It should also be remembered that under all circumstances poisonous substances are being formed in the body and are constantly eliminated by the kidneys, the bowels, the lungs, and the skin, and when this elimination is checked or arrested, as often happens in the course of infectious processes, an auto-intoxication takes place which bears its share in the production of symptoms [Bouchard(16)].

When we find ourselves in face with the problem just how we should explain the clinical and anatomical effects of infection, such researches as these should make us cautious. Bouchard, at the end of a series of researches as to the nature of the cholera infection, comes to the conclusion that there are two classes of influences at work: first, the poison primarily produced by the specific organism, whatever that may be; second, a secondary poisoning due to uræmia (itself a complex and variable cause), and that each of them have their own symptoms, which may succeed or alternate with each other. How rarely, in dealing with the clinical results of infectious disease, do we take these secondary processes into account. [See Joaquin de la Pezuela; *El Progresio Medico*, April, 1894.]

So far as we now know, the principal effects produced by the infective agents acting on the human nervous system are the following:

A. A series of *primary disorders* is induced, not directly due to gross lesions, but to the toxic action of one or more of the *soluble elements* of the (often complex) poison.

In this class of primary toxic affections belong the symptom-complexes of tetanus, rabies, and whooping-cough, a portion of the cerebral, spinal, and meningeal symptoms of acute infectious diseases, and perhaps many of the characteristic symptoms of diphtheria, Landry's paralysis and chorea. It is not presumptively impossible or even improbable that even (temporary) symptoms of peripheral-nerve disorders may be due to poisoning without recognizable lesions. Lesions may, indeed, be generally found, but it is by no means to be assumed that they were the cause of the symptoms noted as typical.

It will seem less remarkable that this infiltration of toxic substances should occur, even to the extent of causing the death of the nerve elements, without giving rise to demonstrable lesions, if we consider the case of ether. This is well known to be a nerve poison, and if injected into the tissues in the neighborhood of a nerve, degeneration will follow. On the other hand, when an exposed frog's nerve is kept moistened at one point with ether, its power of conduction may be inhibited for at least forty minutes at a time (Bowditch), and yet on the removal of the ether the nerve may resume its functions as if uninjured.

It has been made pretty certain that the signs that we think of as characteristic in the nervous affections following infectious processes are due far more to the toxic substances which are developed in the course of bacterial action than to the micro-organisms themselves.[1] This is a principle, the importance of which is being more and more clearly shown as time goes on. The formation of tubercle and abscess and the exudation of purulent meningitis imply the presence of micro-organisms, and bacteria are found now and then in the brain, spinal cord, and nerves, under various circumstances, without its being possible to say as yet what their relation is to the lesions accompanying them.

It is only in the case of lepra that the bacteria may be said actually to invade the nerve cell or nerve fibre (Babes(9) and others), and even here the occurrence is not constant (Kuhne, Zambaco-Pacha). Ordinarily, the bacteria lie in the lymph spaces. The presence of histological cell-changes after infection does not necessarily imply the direct action of bacteria, for they may occur in a typical form where only sterilized and filtered cultures have been used, as has been shown by Welch(93) for the case of diphtheria. [See, also, Flexner, loc. cit.]

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[1] *Vide* editorial, Therapeutic Gazette, 1894, p. 185; also, Flexner [Toxalbumins, etc.], Medical News, August 4, 1894.

B. The *peripheral nerves* suffer from disorders of nutrition due to

1. Infiltration with toxic substances;
2. Interstitial and vascular disorders;
3. Diseases of their trophic centres.

As compared with neuritis due to mineral poisons, the infectious neuritis is perhaps more frequently due to the second of these causes (Cramer), but the distinction is not absolute.

C. The *cerebral*, and to a less extent the *spinal membranes* become breeding-places for colonies of bacteria. Possibly, meningitis is occasionally due to the irritation of soluble toxines, as in some cases of scarlet fever [Bendel]. (*Wiener med. Presse*, 1894, No. 23.)

D. Focal (generally hemorrhagic) non-suppurative *lesions of the brain, cord*, or *nerves* may be set up by either bacteria or their toxic products. It must be admitted that as yet we know but little of this important matter except through experiments with animals, though acute lesions of this sort are met with which are supposed to be of infectious origin. Bacteria of many kinds have, to be sure, been found in the central nervous system, though rarely, in man, as the obvious cause of focal inflammation, with the important exception of abscess and tubercle. Characteristic bacteria are also claimed by Pfuhl to have been found in the foci of encephalitis following influenza. Fortunately, we now know that specific toxines are capable of exciting focal lesions, and we are prepared to listen with respect to the clinical evidence indicating a direct causal connection between the soluble poisons of influenza, diphtheria, variola, scarlatina, typhoid, gonorrhœa (Leyden, Hayden and Parmentier, Dufour), and the focal myelitis which sometimes follows them.

Enriquez and Hallion (Soc. de Biologie, April 14, 1894) have also found that the toxines of diphtheria injected under the skin of dogs may cause, *if the dose is not too large,* intense congestion of the gray matter of the cord, with hemorrhages, and foci of inflammation, characterized by formative irritation of the neuroglia and destruction of nerve elements. Symptoms suggesting a similar process were also seen in an ape. Animals are, perhaps, more subject than man to *toxine myelitis.* At any rate, localized destructions of the gray matter of the cord have been found by Gilbert and Leon (*Semaine méd.*, 1892, p. 65), and more recently by Thoinot and Masselin (*Rev. de méd.*, June, 1894) after inoculation with virulent cultures of the bacillus coli communis; by Bourges (Soc. de Biologie, 1893) after injections of erysipelas cultures (streptococcus pyogenes?); and by Vincent (*Arch. de méd. expérimentale*, 1893), after inoculation with typhoid bacillus. Roger, also (*Ann. de l'Institut Pasteur*, 1892), has produced a poliomyelitis by inoculation of rabbits with a streptococcus obtained from erysipelas, and his observations are particularly interesting from the fact that this result only attended a certain phase of virulence of the organism, which he was not able to reproduce at will.

It is probable that acute myelitis in man is sometimes of infectious origin. The occurrence is rare, but we are not called on to reject the evidence on this account. The possibility of secondary infection should, of course, never be lost sight of. Auché (*Semaine méd.*, Nov. 1894, Soc. de Biologie) found a secondary streptococcus infection to be the probable cause of a myelitis following variola.

E. Diffuse lesions of nutrition of nerve-cells and tracts are being found more widely in proportion as our means of investigation improve, as witness the changes in the posterior columns observed by Bikeles in diphtheria. It is quite possible, however, that many of these are due to œdema or disorders of circulation (see Edinger, *Sammlung klinischer Vortrage,* No. 106).

The most careful research into the character of the earliest lesion in cases where hitherto lesions have been supposed not to be found are those described by Golgi(41) as occurring in *rabies.* The nerve cell shows impairment of its nutrition by peculiar changes affecting the size and contents of the nucleus. The cell-protoplasm, the endothelium of the vessels, and the neuroglia take part in the change, which is one first of irritation, then of reaction and repair. Golgi(41) denotes the whole process an "encephalo-myelitis parenchymatosa." The irritative stage is associated with active hyperæmia. He distinctly asserts that the histological peculiarities, taken by themselves, are not pathognomonic. They only mark where the poison has struck, and perhaps indicate the severity of the blow. It is especially noteworthy that most of these changes, as observed in rabbits, were found before the stage of complete paralysis had been reached, and similar lesions were in fact noted in the cerebellar cortex within four or five days after inoculation and before any symptoms had appeared. One is reminded by this statement of the peculiar form of parenchymatous neuritis observed by Gombault in guinea-pigs, as a result of chronic lead-poisoning, at a period when the animals appeared to be perfectly healthy. Golgi further notes that the changes which he found in rabies are very similar to those which he had discovered in chorea, in spite of the wide etiological and clinical difference between the two affections.

It may be noted as a bit of caution that minute changes such as Golgi describes are only to be accepted as pathological when made by trained observers and under the most favorable conditions of preparation. Even then it might not always be easy to say that we were not dealing with the effects of fatigue or of œdema, and still more difficult to distinguish between the action of specific toxines and that of the toxic products of disordered nutrition. A good deal has been made of vacuolation of the nerve cell as pointing to some toxic influence, and Campbell(20) has devoted an interesting paper to this subject. Vacuolation has, however, been noted under such varying conditions that one may be allowed to wait for a more general consensus of opinion as to whether it indicates anything more than one of the ways in which nerve cells regularly degenerate. It certainly affords no means of distinguishing between bacterial poisons and others [Afanassijew, Campbell].[1]

More important than the histological changes described by Golgi is the distribution of the lesions which he noted. There would have been no special reason to suspect that the brain and cerebellum as well as the medulla and spinal cord would be involved in rabies, and the fact that this is found to be so, assuming that the observation is correct, is an additional reason for thinking that many poisons which seem to be very limited in their action, judging by the symptoms which they excite, are really universal nerve poisons, and will excite widespread lesions if time enough is given them.

When we pass beyond these minute parenchymatous lesions, the change which seems most characteristic is vascular congestion with infiltration of leucocytes, often associated with hemorrhage, and perhaps due to endothelial changes, at least in part. This tendency has been so often discussed with relation to infectious processes in other parts of the body that it need not detain us here further than as suggesting that the œdema so produced may in itself be a cause of some of the associated nerve lesions. It might, for example, cause degeneration of nerve fibres, by pressure or disturbance of circulation, and might perhaps cause such destruction of nerve cells as is seen in poliomyelitis. In general, when the hemorrhage and exudation are of infectious or toxic origin there is probably at the same time an actual infiltration of poison into the nerve elements and the other tissues in the immediate neighborhood of the affected vessels; but whether this infiltration precedes the congestion, or is a necessary factor in its production and localization, is unknown. Flexner [*Med. News*, August 4, 1894] makes an interesting contribution to the study of these focal lesions as affecting the liver and kidneys and other organs.

The next question to be considered, and one which is especially important to the neurologist, is with regard to the influences which increase the liability of the nervous system to suffer from the infectious processes—the contributive causes of disease.

The question is really divisible into two parts, which need to be carefully distinguished. The first concerns the influences which lessen the power of resistance of the body as a whole to invasion by the organisms of disease, the second concerns only the influences which increase the vulnerability of the nervous system, or lessen its power of resistance, in respect to the poisons produced by the organisms after the invasion has taken place.

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[1] Afanassijew: Acuter u. chron. Alcoholismus, Beiträge zür Path. Anat. u. Allgem. Pathol., 1890, p 443.

The distinction is an important one. A healthy person, with intact mucous membranes and vigorous nervous centres [see Bouchard, Chorrin, Gamaleia, Buchner, Gley], might resist the onset of infection, while even a healthy nervous system might not be able to withstand the action of a specific virus. Indeed, it is open to question whether the specific poisons do not affect healthy nervous centres more strongly, sometimes, than enfeebled nervous centres. For the response to the action of a poison, as in the case of tetanus, for example, though it takes the form of a symptom of disease, is often in reality a sort of reaction which sometimes implies a certain degree of previous vigor. It is obvious that a difference would also be likely to exist between the character and degree of the functional response to acute intoxication, and the liability on the part of the nervous system to suffer local lesions of nutrition, which experiment has shown to attend toxine poisoning as well as the direct action of bacteria.

It will probably be found that strong nervous centres are as liable as weak ones to exhibit the *toxic symptoms* of acute infectious poisoning, while feeble nerves and nerve-centres are more prone to show *disorders of nutrition* under the added strain which the presence of the poison brings to bear, especially if this is reinforced by impaired circulation or œdema.

A few of the questions touched upon in the foregoing summary may profitably be considered a little further from the standpoint of the practical physician.

Among the post-infection disorders of the nervous system there is none so common as *neuritis*, involving usually many nerves in a symmetrical manner, but sometimes single nerves. There can be but little doubt that the infectious toxines are capable of causing neuritis, but it is also probable that we habitually include under this name a number of affections which might properly be separated. Such are: 1, the neuritis attending the first stage of an infectious process before there has been time for the development of general disorders of nutrition; 2, the post-infectious neuritis, in the production of which general disorders of nutrition and a variety of other causes play an important part; 3, the acute, usually fatal and hemorrhagic, neuritis of unknown origin.

Finally, it should not be forgotten that what we have considered as neuritis is often associated with nuclear and diffuse spinal lesions, and that better methods of investigation may show these to play a more important part in the production of the symptoms and nerve lesions than has hitherto been supposed.

Paralysis of the peripheral type may be unattended by demonstrable lesions, and this fact has lent support to the view that the spreading forms of paralysis to which the name of Landry is attached may belong in the same category with polyneuritis.

According to the view of those who believe in this relationship, and among them are such careful and intelligent observers as Ross[1] and Leyden,[2] there is no marked difference in clinical history between selected cases of spreading neuritis of the ascending type and the affection to which the name of Landry is attached, and the mere absence of demonstrable lesions does not, they think, justify us in setting apart the latter cases as belonging to a special group.

On the other hand, there are not wanting thoughtful and conservative pathologists, among whom Hun[3] may be mentioned, as having given the subject a careful revision, who hold that so long as there does appear to be a class of cases where the disease is generally fatal, and yet no definite lesions are found, there is nothing gained by lumping them, for the sake of pathological unity, with demonstrable cases of neuritis.

Both of these arguments have their value, and it is a gain to be able to recognize this fact, even though a positive conclusion is beyond our reach.

It is important to strive after pathological unity, and to learn to recognize the bond between conditions which are ostensibly unlike. It is equally important to realize that the reasoning which tempts us to substitute theory for observation is a dangerous weapon.

It seems to me that this much can be safely said: That the mere absence of demonstrable lesions in a given case of poisoning cannot be taken as proof that the pathogenesis of the symptoms is not the same as in another case where lesions were found. That which is characteristic is often the primary action of the poison rather than the effects of the lesions, even when lesions are present.

The history of tetanus and diphtheria, and perhaps rabies, gives warrant for this assertion. For in some instances of these diseases few or no lesions are discoverable, while in others the lesions are more extensive than the symptoms would have suggested. Goldscheider (*Berl. klin. Wochenschr.*, June 4, 1894, p. 546) takes the position that the presence or absence of demonstrable lesions in Landry's paralysis is a matter of slight importance. Jolly (*Ibid.*) takes the position assumed by Hun.

Part of the symptoms of acute hemorrhagic [infectious?] neuritis are unquestionably of peripheral origin—those, namely, which are due to the pressure of the endoneural exudation. It is, however, far from certain whether death, in these cases, is due to the neuritis or to a poisoning of the nerve centres.

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[1] A Treatise on Peripheral Neuritis, 1893.

[2] Zeitschr. für klin. Med , vol. xxiv.

[3] New York Medical Journal, May 30, 1891.

Leyden, as well as various other observers, has called attention to the fact that in some of these cases changes in the spinal cord are discoverable, one of the commonest of which is swelling of axis-cylinders.

This was very noticeable in a case studied by myself, where death occurred at the end of a week, from respiratory paralysis. (*New York Journal of Nervous and Mental Diseases*, 1887.) Edinger [*l. c.*] thinks that this swelling of axis-cylinders is often referable to œdema, but it is probable that it at least implies an impairment of resistive power of morbid origin.

As regards the more chronic forms of neuritis which follow known infection, there can be but little doubt that they are toxic in origin; but it is for most of them quite uncertain whether the poison is identical with that which caused the primary infection, or is due to secondary disorders of metabolism. It has been suggested that the stimulants given during the illness may be a contributive cause [Starr].

The peripheral nerves (or their trophic centres) are singularly sensitive to poisons of many kinds. Ross enumerates forty causes of neuritis, and a few more could be added to the list.

Among those recently noted are puerperal conditions [Moebius(62), Bassette (11); see also *Nouvelles Arch. d'Obstet. et de Gynécol.*, 1894, No. 9], erysipelas [Grasset, Lew], septicæmia [Lloyd and Riesman(59)], pyelonephritis [Dana], suppuration of the pleura [Fiessenger(35)], gonorrhœa [Engel-Reimers (*Jahrbücher der Hamburger Staatskranken Anstallen*, 1890)].

It is true that the lesion is not precisely the same in all these cases. In the form which follows acute infectious diseases the morbid process may centre around the bloodvessels, and is said to be, in general, rather interstitial than parenchymatous [Cramer(22)]. The spinal cord is apt to be involved with the nerves in these cases. In some instances the parenchymatous degeneration may be due to the pressure of œdema. In the acute (hemorrhagic) form, which is supposed to be of primary infectious origin, the trunks of the nerves and the nerve-roots may be involved, as well as the peripheral portion. Different varieties of degenerative neuritis are also described, such as the "peri-axillary" and "segmental" forms.[1] It may be that careful research will show that where an irritant organic poison is circulating in the blood, capable of causing neuritis, the endothelium of the vessels will show changes like those described by Golgi as occurring in rabies.

The *cerebro-spinal membranes* afford a remarkably favorable breeding-place for many kinds of bacteria. The symptoms are probably due partly to the exudation itself, partly to the irritation of the sensitive membrane, partly to the absorption of toxic products. The organism which plays the largest part in the production of both the epidemic cerebro-spinal meningitis—the sporadic forms not associated with suppuration elsewhere, and the meningitis which sometimes accompanies pneumonia, is the so-called pneumococcus, or micrococcus lanceolatus. The history of this important bacillus has already a voluminous literature, but interesting analyses are given in the papers by Netter(63), Welch(93), Foà,[1] and in the report of the admirable research by Flexner and Barker(37) into the nature and causes of the recent epidemic of cerebro-spinal meningitis at George's Creek Valley, Md. This [pneumococcus] form of meningitis seems to be by far the most common variety even of those occurring independently of epidemics of pneumonia. Out of thirty such cases Netter found sixteen to be due to this organism, while the largest number induced by any other single organism was six. Out of forty-five cases of primary meningitis reported by other observers and collected by Netter, thirty were instances of pneumococcus infection.[2]

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[1] This whole subject has been recently worked up by Cramer(22), with great thoroughness.

Flexner and Barker do not find it probable that in epidemics of cerebro-spinal meningitis the micrococcus invades the body principally by the air-passages. They think it more probable that it passes into the digestive tract and thence, by way of the blood, to the brain. It is interesting to note, in this connection, that the injection of cultures does not excite meningitis in animals, unless made directly into the cerebral cavity.

The high importance of both simple and purulent, and especially obstructive inflammations of the antrum, nasal sinuses, and ethmoid cells for the introduction of both this organism and others to the cerebral membranes, has of late been commented on by many writers (Beck, Macewen, Dmochowski(29), Neumann and Schaeffer(64), Allport(4).

I cannot leave even this hasty reference to the bacteriological origin of meningitis without calling attention to Macewen's masterly work on the *Pyogenic Diseases of the Brain*, in which a searching anatomical and clinical analysis is given of the mode of invasion of the organisms, the formation of abscess, and the origin and spreading of thrombosis and meningitis.

Not only are purulent meningitis and cerebral abscess excited by infection from the ear and naso-pharynx, through the introduction of the organisms already mentioned, but also meningitis is occasionally due to the bacillus of typhoid. (Tictine, Adenot, Drews.)

It is possible that the poison of scarlet fever and measles may occasionally be the direct cause of meningitis [see Bendel, *loc. cit.*]; but our knowledge of this subject is meagre.

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[1] Zeitschr. für Hygiène, 1888.

[2] In a sporadic case of this sort, which I saw in consultation with Dr. Edward Forster, the whole illness lasted but five days, by the end of which time the corneas were opaque and the conjunctivæ purulent. The bacteriological examination was made by Dr. Wright, of the Harvard Medical School.

Reference was made in an earlier part of the paper to *acute, primary, hemorrhagic encephalitis* as occasionally following various forms of the acute infectious disorders, and also as occurring without known infection, though perhaps not independently of a toxic cause. It is not necessary to discuss the matter further except to record a possible source of error in the diagnosis and even in the pathological examination. In a collection of cases of post-influenzal diseases reported by myself(75), one was included which, at the time the examination was made, I believed to be an example of this disease, but subsequent examination showed that nothing more than œdema could be made out with certainty. The case was one of considerable interest because the symptoms were so marked and so serious. An additional case is reported by Koenigsdorf (*Berlin. klin. Wochens.*, 1892, No. 9).

The subject of the relation of the *chronic spinal scleroses* to infectious processes is full of interest to both the physician and the pathologist. No doubt can be entertained as to the bare existence of the practical relationship. Everyone knows how frequently locomotor ataxia and lateral and mixed scleroses follow syphilis, though often at a period when the signs of the primary infection have long since ceased to show themselves. The relation of disseminated sclerosis to several infectious processes, and especially to malaria, is almost equally evident. I have, myself, seen a very convincing case of the latter sort.

What is the nature of this connection? We do not know, but I think it clears the way, in a measure, to note again the natural proclivity of the nervous system to become diseased in these ways. If we do this, we shall be more inclined to be catholic in admitting other causes besides the specific virus. The case of syphilis in its relation to locomotor ataxia and other spinal scleroses is a case in point. It contradicts all that we know of the action of syphilis, and the usual seat of its lesions, to assume that it is the direct cause of these degenerative scleroses, and it is delusive to try to help put this opinion by assuming an attenuated virus, or by calling to witness the rare instances of improvement under potash and mercury.

It is certainly true that gummatous inflammation sometimes gives rise to many of the symptoms of locomotor ataxia, and that this may be cured; and it is true, also, that various modes of treatment may help ataxics for a time. But the relation of syphilis to locomotor ataxia, though I think unquestionable as a clinical fact, is not to be explained satisfactorily, except on the assumption that some new, and perhaps toxic, influence is brought into play. Perhaps this influence would not be effective were it not that the nervous system is prone to suffer from the disease.

Sclerosis of the posterior columns occurs as a sign of structural weakness in Friedreich's disease;[1] it follows ergot, pellagra, and lathyrus poisoning; it occurs as a part of the degenerative process in chronic paralytic dementia; as a consequence of morphine-poisoning in dogs [Alt(5)]; and its outbreak is precipitated, to say the least, by such processes as influenza and trauma.[2]

Most important of all, posterior sclerosis is sometimes associated with progressive pernicious anæmia, and perhaps with other affections which, like that—to speak of what is probable though not proved—originate in auto-intoxication, due, perhaps, to morbid changes in the digestive tract.

The first communication on this subject was by Lichtheim, in 1887 (*Sixth Congress für innere Med. zu Wiesbaden; Verhandlungen*, p. 84); but, in 1893, Dr. W. Minnich published a careful monograph on the subject, and gave full reports of all the cases observed up to that time. Previously to this, and before I had seen Lichtheim's communication, I had observed a series of cases, one, or perhaps two, of which were certainly cases of pernicious anæmia, and in 1891 I published a paper under the title "A Group of Cases of Sclerosis of the Spinal Cord Associated with Diffuse Collateral Degeneration, Occurring in Enfeebled Persons past Middle Life, and especially in Women." (*New York Journal of Nervous and Mental Diseases*, February, 1891.)

The clinical reports were meagre, but the cases were of much interest. Various partial causes were noted, and among them lead-poisoning and chronic diarrhœa, a cause of degenerative affections to which attention has of late been called anew.

It is true that Minnich declines to admit that his cases are of the same order with locomotor ataxia, or even with the sclerosis of ergot (Tuezec; Grünfeld, *Arch. für Psych. u. Nervenkrankheiten*, vol. xxi. p. 618); but he is unable to explain them on a different basis except that they seemed to originate in foci of disease related to the vessels, and he admits them to be probably toxic in character.

His interesting paper also contains an account of another form of change in the posterior columns which seems to occur in some cases of pernicious anæmia, probably toward the end of life, and to be due to œdema. The rest of the cord is affected to some extent.[1]

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[1] What is true of posterior sclerosis is true, also, of the other spinal scleroses and degenerations and the mixed forms, among which latter Friedreich's disease belongs. (See a paper and discussion by Strümpell and others. Wiener klin. Woch., 1894, No. 4, p. 69. Mendel here remarks that even multiple sclerosis may rest on an hereditary basis.)

[2] See a paper by Morton Prince, read at the meeting of the Neurological Association, 1894, and Klemperer, Zeitschr. für klin. Med., xvii., 1890. The interesting observations and ingenious theory by Obersteiner and Redlich (Institut für das Studium des Nervensystems, etc., zu Wien, Heft 2) can by no means be considered as closing the discussion as to the pathogenesis of tabes.

The argument that the posterior roots are squeezed at their entrance into the cord by a thickening of the membranes, of syphilitic origin, fails, as the authors recognize, to account for many other associated lesions of tabes, and fails, too, to recognize the rapid increase in symptoms which attends influences of general depressive character, such as influenza and trauma.

Lichtheim refers to other conditions besides those which I have mentioned, which contribute to disease of these tracts, and among the rest suggests the stream of sensory excitations which the tracts are called upon constantly to conduct.

Edinger has recently worked out an elaborate theory which certainly, in part, is applicable here, according to which the failure of repair to keep pace with waste accounts for some of the diseases which we have been considering. (*Sammlung klinische Vorträge*, No. 106.)

It is true that just as there are differences between the different forms of neuritis, so, also, the posterior sclerosis which follows syphilis is probably not identical with that due to the other causes mentioned. The ergot-sclerosis, for example, is not so malignantly progressive, and is, perhaps, anatomically different; and there are other peculiarities of the different varieties, some of which are pointed out by Raymond(78) and by Friedheim(38). All that I wish to maintain is that there is a strong bond of resemblance connecting them all. There is even some evidence, apart from the important case of Friedreich's disease, that tabes may be a member of the so-called neuropathic family. We have all seen cases which suggested this tendency. Raymond says that it is especially prominent where the tabes develops in the later years of life.

It would not be worth while to attempt here even a cursory survey of the typical *syphilitic* lesions of the nervous system, the subject is so vast and has been so much discussed.

As regards the less common lesions of syphilis, I will refer to two forms which seem to me of decided importance.

One of these is a form of myelitis closely resembling the ordinary transverse dorsal myelitis, but differing from it in some respects, and apparently dependent upon syphilitic infection. The disease is of slow development, and the spastic element is strongly marked, in proportion to the paralysis and the loss of sensibility, which are relatively slight. The patients may improve, especially under the influence of an energetic specific treatment, while, at the same time, neither the symptoms nor the improvement point to typical gummatous disease. This form was first described by Erb, in the *Neurologische Centralblatt*, No. 6, 1892, under the heading of "Syphilitic Spinal Paralysis." Since then communications confirming Erb's view have been published by Kowalewsky (*Neurologisches Centralblatt*, 1893, No. 12) and by Kuh (*Deutsche Zeitschrift für Nervenheilkunde*, 1893, iii. 6).

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[1] Quite recently Bikeles has observed similar degenerations of the posterior columns after diphtheria. [Arbeiten aus dem Institut für das Studium des Nervensystems, etc. Zu Wien Heft 2.]

The second form of syphilitic disease of which I wish to speak is that where more or less typical lesions of syphilis are associated with those of tabes. This is a very important connection, because cases of this sort are perhaps those where the symptoms of tabes yield, in some measure, to anti-syphilitic treatment.

Dinkler (*Deutsche Zeitschrift für Nervenheilkunde*, 1893, iii. 4 and 5) reports a striking case of this kind, and gives references to the earlier literature. [See, also, Sachs (*New York Med. Journ.*, January 6, 1894).]

As regards *diphtheria*, the conflicting nature of the views respecting the character of the nerve lesions is well brought out by a comparison of the comparatively recent descriptions by Gowers, Arnheim, Hochhaus, and Cramer. Gowers and Arnheim describe the neuritis as parenchymatous, while Hochhaus and Cramer think that in diphtheria (as in the other infectious processes) the primary change is vascular and interstitial, and Hochhaus refers many of the symptoms to pressure of œdema. Gowers quotes an interesting observation by Boissarie (*Gaz. Hebd.*, 1881, Nos. 20 and 21), describing a series of cases occurring in Paris, of paralysis of the palate, eyes, limbs, heart, "perfectly like that which occurs after diphtheria, and accompanied by albuminuria. The remarkable fact is that in these cases of primary palsy there was no history of preceding sore-throat, and in several of the cases distinct diphtheria followed the paralysis, which lessened during the throat affection. Some of these cases of primary palsy seem to arise by infection." At the same time there occurred a series of cases of severe diphtheria. In the light of recent bacteriological research it may be assumed with confidence that careful examination of the throat would have shown that the bacteria were really present, even where no soreness of the throat had occurred.

The experimental study of the nerve lesions of *diphtheria*[1] has given conflicting results. Good observers have repeatedly failed to discover histological changes to account for paralyses experimentally induced, and although changes have been found in man, especially in the peripheral nerves, yet they have been occasionally missed [even by recent observers; see Bikeles' paper in *Obersteiner's Arbeiten*, Heft 2, 1894], and perhaps represent only a terminal stage in the process.

Quite recently an experimental research by Stscherbak(86) has given more positive results. The changes which he observed can be divided for convenience' sake into two sets: those involving the peripheral nerves, consisting in well-marked degeneration, which on the whole corresponded in position and intensity to the paralytic symptoms, and those involving the spinal cord, membranes, nerve-roots, and the muscles. The former he regards as constant; the latter rather as incidental than typical.

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[1] For an excellent account of the pathological anatomy of diphtheritic paralysis see Gowers' Diseases of the Nervous System, second edition.

B. The diseases of the nervous system which are suspected, but not proved, to be of infectious origin, are, especially, beri-beri, poliomyelitis, Landry's disease, certain forms of myositis, neuritis, myelitis, some of the cerebral palsies of children, chorea, disseminated sclerosis and other cerebro-spinal and spinal scleroses, amputation neuritis, herpes zoster.

The grounds on which a disease may be suspected to be of infectious origin are, when bacteria are found in the tissues; when the outbreaks occur in epidemics or are related to seasons or locality; when vascular and histological changes characteristic of the infection are found; or specific toxicity of the blood and urine; or if the disease has become much less frequent since the introduction of antiseptics.

On this latter ground the intractable *neuritis following amputation* has been suspected to be of infectious origin [Page(70)]. It is true that even when great care is taken to prevent infection amputation neuritis still occasionally occurs, but it should be remembered that at the best surgical asepsis can be but relatively perfect.

As regards the lesions to which the nervous system is liable as the result of infectious disease, there are some which are more or less characteristic in view of its structure and liabilities, and others which it shares with other organs and tissues of the body. Of the latter class are the vascular lesions, hemorrhage and exudation, which are of vaso-motor origin or due to changes in the vascular walls such as are liable to occur in any part of the body. Where well-marked evidences of these vascular lesions occur it is common to consider them not only as evidence of infection, but also as the cause, rather than the consequence, of the parenchymatous lesions with which they are associated. This argument has been used of late with confidence and ability by Goldscheider(40) in support of the theory of the infectious, or at least the toxic, origin of acute hemorrhagic neuritis or myelo-neuritis and encephalitis, as well as of *poliomyelitis*.

It is certain that in this latter disease the signs of congestion and leucocyte infiltration are prominent, and a case published by myself in the *Journal of Nervous and Mental Diseases*, 1883, not included in Goldscheider's(40) or Siemerling's(85) lists, fully supports this view. In the report of this case it is expressly noted that the wasting of the ganglion cells was not by groups, but "depended on their position with regard to the centre of inflammation" (p. 19), and that "the process is not one which affects ganglion cells materially more than other tissues in their neighborhood." It was also suggested (p. 24) "that the original morbid change was one affecting the vessels and the circulation." At the time this paper was written much less was known than now about infectious processes. Death had occurred at the end of two months, and the lesions were, therefore, comparatively recent.

Another argument in favor of the toxic theory of poliomyelitis is that this disease is certainly related to the acute (often hemorrhagic) polyneuritis, and that for this disease we find the same evidence of toxic origin, but in a still more marked degree.

In both affections we see the strong vascular element in the onset; in both the occasional relation to acute infectious disease, and with neuritis the relation to beri-beri.

As regards the analogy between poliomyelitis and neuritis, several instances of the combined occurrence of the two diseases have been published [Gowers(43)]; and the writer's experience bears out these views. In the case of central myelitis above alluded to as observed by myself, the clinical evidences of severe and widespread peripheral neuritis were unequivocal.

It is not impossible that we group, clinically, under the name of poliomyelitis, several affections which might in strictness be separated; or, in other words, that several different poisons are liable to affect the anterior horns of the spinal cord, exciting results which, though in the main alike, may differ in detail.

The experimental evidence is in favor of this view, and it is strengthened by the varying characters of the so-called epidemics of poliomyelitis, of which a number are on record. Perhaps the most remarkable of them is one which occurred in and near Rutland, Vt., during this past summer, and has been studied by Dr. C. S. Caverly (*Medical Record*, Dec. 1, 1894), and by Dr. Andrew Macphail, of Montreal (*Medical News*, Dec. 8 and 22, 1894). The number of cases studied was 126, and the symptoms of some of them were so peculiar that, although the diagnosis of "poliomyelitis" was considered as the most probable one, it was not regarded as perfectly satisfactory.

I can also place on record one more apparent epidemic of poliomyelitis (though a small one, considering the area concerned, and perhaps for that reason unimportant) which was observed in Boston during last autumn (*Boston Medical and Surgical Journal*, 1883, ii.). References to other instances of the kind are there given.

Since the publication of Goldscheider's communication on the nature of poliomyelitis other confirmatory observations on the same subject have been published. [Siemerling(85).]

Although, however, the idea is generally accepted that there is a toxic cause for poliomyelitis, no one has strongly affirmed that this disease is of bacterial origin.

As regards the infectious origin of *Landry's paralysis*, all we can say is that it occasionally follows recognized infectious diseases, and that its abrupt onset and rapid course, often at least unattended by gross lesions, point definitely to some toxic cause. There is no reason at present for calling this cause bacterial.

The theory of the infectious nature of *chorea* is interesting, but still far from being proved. The subject is well presented in papers by Pianese(73)[1], of Naples; Dana(24), of New York; Berkley, of Baltimore (*Johns Hopkins Reports*, 1891), and a number of authors cited by them.

Pianese's investigation dates back to 1891. The only point which needs to be mentioned here is that he found in the cervical portion of the spinal cord, the medulla oblongata, and the cerebellum—but not, it would seem, in the brain proper—a bacillus which he considers as specific and which he was able to cultivate and use for experimentation. Injections of pure cultures into animals gave rise to motor symptoms and often death, but did not cause anything that could be called chorea, so far as can be judged from the abstract at my disposal. In the animals experimented with the bacillus was found again in various parts of the nervous system including the brain. Pianese has also examined the blood in a number of cases of ordinary chorea, and in one of them succeeded in finding this bacillus.[2]

Dana's(24) first article was published in *Brain* in 1890, and contained a report of accurate investigations into the pathological anatomy of chorea. His examination confirmed and defined those of previous observers, among whom Hanford (*Brain*, 1889–90, p. 129) may be specially mentioned. It seems clear that the most obvious change consists in vascular congestion, dilatation, sometimes leading to thrombosis or capillary hemorrhage, and that widespread degeneration of the nerve elements may also occur, besides subacute meningitis. In Dana's(26) second paper, besides changes of these sorts (though in this case the signs of vascular congestion were less marked), a small number of micro-organisms resembling the diplococcus lanceolatus were found, by H. T. Brooks, in the deeper layers of the pia mater and the superficial part of the cortex. The case was not one of typical chorea, however, and the number of micro-organisms was too few to warrant their being considered other than incidental.

Dr. Berkley's elaborate investigation showed a series of minute changes, of which the chief involved the membranes and vessels. Areas of focal inflammation were found in various parts of the brain, medulla, and pons, and among other conditions which are important as indicating the infectious character of the disease, there was a peculiar endarteritis, which, as Berkley says, is rare in persons of twenty-seven, except from an infectious cause. Micro-organisms were not found, but deposits of detritus were observed which resembled the remains of bacteria. In the second part of his paper, which describes the case of a choreic dog,

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[1] Original paper not accessible; abstract of some length by Eulenburg.

[2] Dr. Mark Richardson, of Boston, has made careful bacteriological examinations of the blood of two choreic patients at the Massachusetts General Hospital, at my request, with negative result. Further experiments will be made.

Berkley compares, in adjacent columns, the changes which he found with those given by Babes(8) as characteristic of diphtheria, in order to show the analogy between the two processes.

If ordinary chorea turns out to be of infectious origin, it will be almost necessary to suppose that the bacillus which causes it is present in a harmless and inactive state in large numbers of persons, for the disease may develop almost instantly, or, indeed, instantly, in consequence of fright.

It is true that some sort of predisposition must, however, be present, for, fright or not, the disease is one which occurs far more easily at certain seasons of the year than others.

As regards the value of Berkley's anatomical argument, it would be, I presume, impossible to say whether the lesions pointed to a toxic agent due to bacterial action or to a toxic agent induced by some form of disordered metabolism, or due to retained excretions.

With regard to the other affections mentioned as possibly of infectious origin, there is but little to say. The argument in favor of this view is mainly that they are apt to follow other general diseases admitted to be infectious, like the acute exanthemata, but the exact significance of that argument is uncertain. One or two recent observations suggesting a relation between malaria and disseminated sclerosis have been published (Marie,[1] Torti and Angelini), and I have myself seen a striking example of the sort. A man in middle life and of good health was attacked suddenly with characteristic and progressive intention-tremor and scanning speech immediately after a sharp malarial attack. Under treatment by arsenic there was a slight improvement, but for the most part the symptoms persisted.

The argument with regard to *herpes zoster* consists essentially in its tendency to occur in epidemics—though it must be admitted that this tendency is by no means strongly marked—and in a somewhat marked liability to follow other acute infectious diseases. [See Weigert(92), Schäffer(81), Kaposi(51), Wasielewski(90).]

The infectious theory of *epilepsy* is as yet hardly in a form to call for critical examination. The argument that the attacks are temporarily arrested by some intercurrent infectious malady, which might be supposed to furnish antitoxines, to the blood, could, one would think, scarcely be seriously advanced by any one familiar with the history and therapeutics of epilepsy [see Féré(33), Marie(60), Quériand(76), Séglas(84), Lannois(55)].

The origin of *beri-beri* is still a matter of doubt, and I will refer to it only for the sake of calling attention to some recent observations,[2] which suggest that it is a protozoal disease, analogous to malaria.

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[1] Mal. de la Moelle.

[2] Scheube. Glogner: Virch. Arch., vol. cxxxii. p. 50.

Glogner calls attention to the periodicity of the outbreaks of the symptoms, and claims to have found changes in the blood and an organism resembling the plasmodium.

Another means by which it is thought that the infectious character of some of these nervous diseases of doubtful origin may be tested is through the chemical and physiological study of the blood and urine. Albu has made this a subject of a special paper, and many other observations bearing more or less directly on this subject have been published. (Séglas, Fisichella, Ewald, Bouchard, D'Abundo(27), Régis and Chevalier-Lavanol(79), Voison and Peron(89); see also editorial with references, in the *Boston Medical and Surgical Journal*, September 14, 1893, and *Archives de Neurologie*, 1893, p. 240.)

These researches have not as yet borne much practical fruit. It is evident that before much can be done in the study of morbid urine the toxiology of normal urine must be thoroughly understood, and for this reason the recent publications of Bouchard are of decided value, though the conclusion which he reaches will doubtless require modification. Bouchard maintains that if men are not poisoned by the products of their own tissue-metamorphosis, it is simply because the poisons which are constantly being formed are as constantly carried off from the blood in the urine, which is toxic to a measurable degree.

He finds seven toxic substances in normal urine, each of which has properties of its own. The first is diuretic in its action, and consists practically of urea. This is only toxic in a considerable dose, and is in general prophylactic in its tendency, since by increasing the quantity of urine it helps to carry off the other substances.

The second ingredient is narcotic in character, and its chemical nature is not known, except that it is soluble in alcohol. The third is also soluble in alcohol and has the peculiarity of causing salivation. The other substances are characterized by their power of causing convulsions, contraction of the pupil, reduction of heat. One of the convulsive agents is potash. In uræmia all these poisons are relatively increased in quantity, and anything which interferes with elimination by the kidneys is liable to bring about this result to a greater or less degree.

SUMMARY.

It is important to separate (*a*) the symptoms and lesions which we can assert to be directly due to the specific toxines of the various infectious diseases, from (*b*) the effects of anæmia, œdema, intoxication from disordered metabolism, on the one hand, and on the other hand from (*c*) the affections which spring into existence because the nervous system was prone to them, either from peculiarities of structure, anatomical surroundings, circulation, and the like; or because other causes had been at work to which the infective poison only contributed new effectiveness for evil.

In the first class (*a*) we can fairly place the symptom-groups of tetanus and rabies; and with reasonable probability the chill, pains, paræsthesias, acute delirium, disorders of micturition, and other symptoms which characterize the outbreak of many acute febrile disorders, though it must be admitted that we know little or nothing positive about their pathogenesis.

The focal hemorrhagic encephalitis and myelitis occasionally observed after influenza and other infectious processes is probably due to the action of the specific poison on the tissues and the vessels. Acute poliomyelitis and acute hemorrhagic neuritis may be of the same origin, though these opinions need further substantiation.

As regards tetanus and rabies, it is not probable that the anatomical lesions which have been found after death (Golgi and others) are actually the anatomical substratum of the characteristic symptoms. They may have been simply of correlative origin.

Post-infection meningitis is generally of purulent character, and implies the presence of micro-organisms; but the non-purulent form bears a relation to infectious disease which is in need of further study.

The paralyses of diphtheria are probably attributable to the direct action of the poison, but, as in the case of tetanus and rabies, it is by no means certain that the lesions sometimes found (though often missed) are the true cause of the symptoms. It is more probable that the first and characteristic effect of the poison is to excite a chemical or molecular change, and that this alone is strictly characteristic. Sometimes the paralysis passes away too rapidly to be attributed to neuritis. The lesions, when present, may be many and various, and the neuritis, which is the commonest form, is of varying types.[1]

The lesions met with in meningitis, and in a certain sense those characteristic of tuberculosis and syphilis, are directly due to bacterial action.

In the following cases the influence of cause *a* is more or less combined with those of causes *b* and *c*.

The question as to the origin of the post-infectious multiple neuritis is one of great interest. The most obvious position to take is in favor of its direct dependence on the infective poison; but, in view of the general fact of the intolerance of the peripheral nerves to poisons of all sorts, it is fair to suspect that the post-infectious neuritis may sometimes be due to toxic substances developed from impaired metabolism and sometimes to anæmia and œdema [Class *b*].

It appears to be occasionally possible to induce neuritis by experimental inoculation with diphtheritic cultures, and the form and sequence under which the diphtheritic paralyses clinically occur suggest the action of a specific poison. If, however, the forms under which neuritis typically occurs are considered, it becomes obvious that natural proclivities of the nervous system are at least contributive causes.

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[1] See, among others, Paul Meyer's paper in Virchow's Archiv, 1881, vol. lxxxv. p. 181.

The variety of conditions under which the spinal scleroses—both disseminated and system scleroses—occur suggests predisposing tendencies of one or another kind, common to all and acting in addition to the various special causes. The recent observations of Obersteiner[1] and Redlich, that the narrowing of the posterior nerve-roots at their point of penetration through the pia matter suggests a mode by which slight pressure [as from syphilitic meningitis] could set up the ascending degeneration characteristic of tabes, do not afford a complete explanation of that disease. This theory leaves unnoticed the close analogy between the syphilitic tabes of the lateral columns and that of the posterior columns. The occurrence of the peripheral neuritis met with in connection with syphilitic tabes, but rarely seen at other stages of syphilis, points to the presence of some poison as yet undiscovered, and strengthens the probability that the posterior-column degeneration of anæmia and ergot-poisoning, as well as that of syphilis, is mainly of toxic origin.

The complex nature of the infective poisons is shown by the varying relation between the toxic symptoms of the first stage (fever, delirium, pain, etc.) and those of the later stages.

In influenza the fever may be of trifling amount and duration, and yet the post-infectious diseases severe and lasting; in cerebro-spinal meningitis the fever is often slight. Again, it has been found possible, experimentally, to neutralize to a certain extent the fever-producing element in bacterial poisons by special antitoxines. [V. Centanni and Bruschettini, *Deutsch. med. Wochenschr.*, 1894, No. 12, p. 270.]

Finally, it is probable that a routine examination, by the best modern methods, of the central and peripheral nervous system, after infection, would show changes to be present far oftener than is now supposed. The studies of Golgi in rabies lend support to this view.

As an additional contributive cause of lesions, fatigue may be mentioned, since the experiments of Hodge(50) show that this is capable of exciting manifest changes in the nerve cells. It is a question for further investigation whether or not fatigue acts more forcibly on nerve centres poisoned by the products of infectious processes.

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CASE OF A LARGE UNILOCULAR BLOOD-CYST DEVELOPING IN THE WALL OF THE UTERUS AFTER THE MENOPAUSE.

BY J. C. WEBSTER, M.D., F.R.C.P. ED.,

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Clinical notes. Mrs. H., housewife, aged fifty-three years, was admitted to Ward 24, Royal Infirmary, on August 11, 1893, complaining of a swelling in the abdomen. It was first noticed by her in February, 1893. About six months before that time she was seized, one day, with a sudden pain in the pelvis after lifting a heavy tub. A week later, when washing, there was a return of the pain. It gradually passed away, and was not noticed again until March, 1894, a month after the abdominal swelling was first recognized. The pain was then so severe that she had to go to bed. It was felt throughout the pelvis, and was of a bearing-down nature; it was worse on the left side, and extended into the thigh. After this period the tumor increased rapidly, and there were recurrent attacks of pain. She lost flesh and became gradually weaker. She was a good deal troubled with frequency of micturition and constipation.

The menstruation began at the age of thirteen. It had always been of the twenty-fourth or twenty-sixth-day type. Each period lasted for three or four days, the quantity being abundant, but not excessive. Before marriage she suffered from dysmenorrhœa, but not afterward. She had never been troubled with leucorrhœa. Three years before her admission she passed the menopause. It had given her little distress. In its commencement there was some menorrhagia.

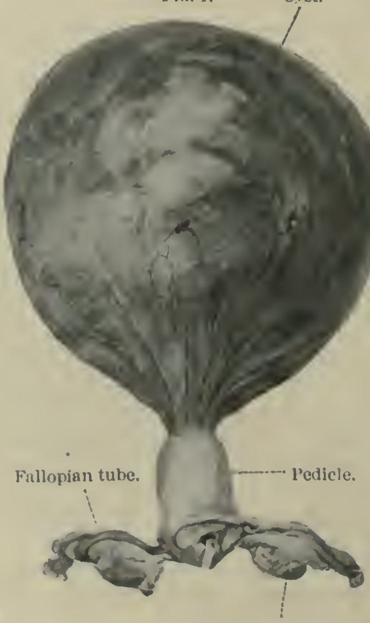
She had been pregnant seven times, first in 1859, and last in 1872. She had miscarried in 1877. The labors were easy with the exception of the fifth, which was tedious. She nursed all her children except the fifth; she suffered from pelvic trouble for some weeks after the birth of this one.

On admission the patient was thin and emaciated, the face being sallow and having an anxious expression. The complexion was sallow. The abdomen showed well-marked striæ and a linea nigra. It was enlarged to the size of a seven-months' pregnancy. On palpation a thin-walled cystic swelling was found. Fluctuation was easily obtained in it.

On bimanual examination, the vagina was found to be roomy, the cervix lying low and looking downward and forward. The body of the uterus was retroverted, somewhat enlarged, and softer than normal. Above it was felt the cyst, which could be moved without displacing the uterus.

Operation. Laparotomy was performed on August 18th by Professor Simpson. The cyst was found to be growing from the fundus of the uterus. It was removed along with the body of the uterus and the appendages. Several adhesions were found on the anterior wall. The patient made a complete recovery and was dismissed on September 16th.

FIG. 1.



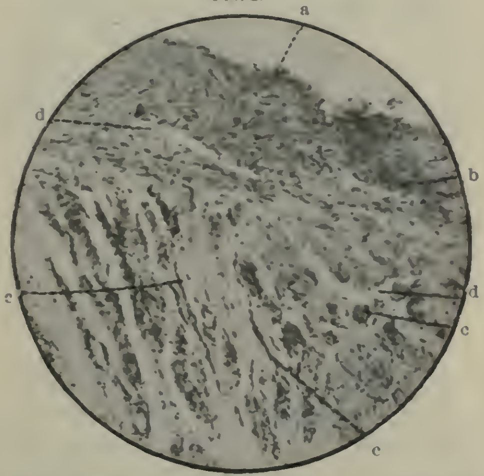
View of the cyst and its pedicle.

Naked eye appearance of the cyst. The cyst-wall was deeply congested, contrasting markedly with the pale uterus; it was attached by a pedicle one and a half inches in thickness. It measured eight inches vertically and seven and a half inches transversely. (These measurements were got after the emptying of the cyst.) The upper and anterior surface was roughened by peritonitis. The pedicle was continuous with the anterior part of the fundus. The uterus was somewhat enlarged; this was due chiefly to the elongation of the fundus.

The cyst contained several pints of dark fluid whose specific gravity was 1018. It was composed of blood, granular débris, flakes of fibrin, and a few cholesterin crystals. The inner wall was smooth in some parts, roughened in others. Here and there layers of fibrin were attached to it. On cutting into the wall several blood-collections of considerable size were seen. In the pedicle several of these were massed together. In the uterine cavity a very small polypus was found attached to the wall at the upper left angle.

Microscopic appearance. The outer surface of the cyst was covered with peritoneum altered in various parts by inflammatory changes. The cyst-wall varied in thickness in different places. That part close to the pedicle was the thickest, measuring about a quarter of an inch. At the opposite end of the tumor the wall was much thinner, measuring one-thirty-second to one-sixteenth of an inch. It varied in structure. Near the fundus it was made up of fibrous and muscular tissue, the former being greatly in excess of the latter. To a large extent the connective tissue was dense and sclerosed. In some places it was in a condition of marked subacute inflammation.

FIG. 2.



Section through portion of cyst wall close to inner surface.

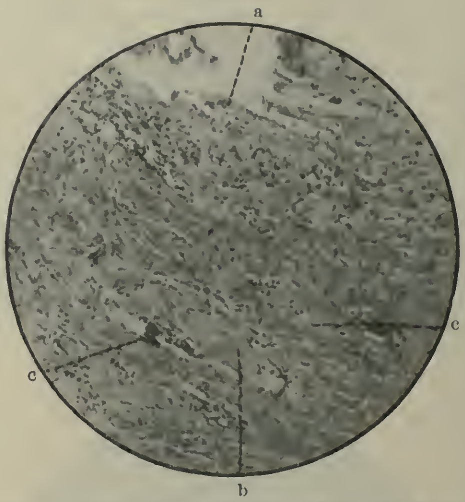
a. Inner surface. b. Dense fibrous tissue. c. Muscular bundles surrounded and compressed by dense fibrous tissues.

The muscle-bundles were separate from one another and were compressed by the sclerosed tissue; some of them were infiltrated with leucocytes. Most of the muscle fibres were in various stages of atrophy. In some cases the distinction between the fibres could not be made out. In certain parts the muscle nuclei appeared to be dividing.

In other parts of the cyst-wall the muscle-bundles were not so altered, being only separated from one another by masses of loose cellular tissue, which had a mucoid appearance in several places. In one or two sections only did one find muscle and connective tissue arranged as in the normal uterine wall. For the most part the muscle-bundles lay parallel with the sac-wall. In the thinnest parts, scarcely any muscle was found at all.

The inner part of the wall for the most part consisted of dense connective tissue varying considerably in thickness. In parts, however, there was no condensation. Here and there blood-fibrin was attached to the inner surface, in many places masses of blood corpuscles were attached to it. Throughout the wall were found many dilated capillaries

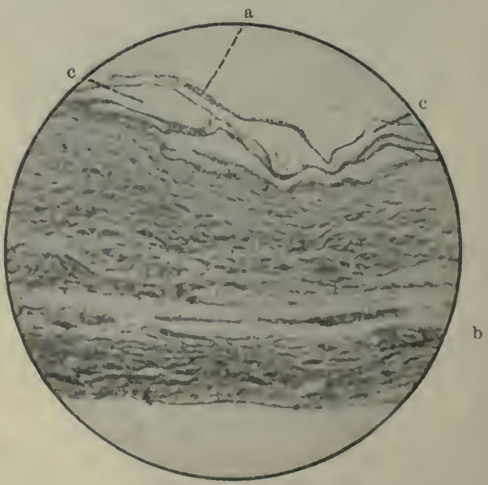
FIG. 3.



Section through portion of cyst-wall close to inner surface.

a. Inner surface. b. Dense sclerosed fibrous tissue. c. Compressed and degenerating muscle-bundles.

FIG. 4.



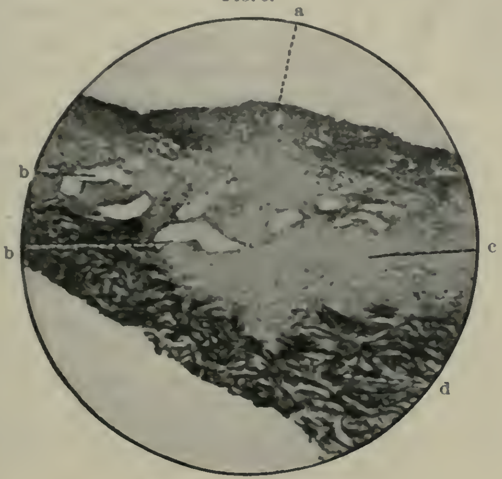
Section through cyst-wall.

a. Inner surface. b. Outer surface. c. Blood-spaces in inner part of wall.

filled with blood. In some parts close to the inner surface very large blood-spaces were found, only some of which were lined by epithelium.

The pedicle of the cyst was formed by an elongation of the fundus. On section it showed the same changes that were found in the neighboring part of the cyst-wall, *i. e.*, great increase of the connective tissue, atrophy and degeneration of the muscular bundles, subacute and chronic inflammation. In this pedicle, close to the cyst, was found a collection of cavities filled with blood, forming a mass about the size of a small walnut; it seemed to consist of dilated capillaries. An endothelial lining could be made out in several places, though in many parts it was wanting. Here and there throughout the pedicle, as well as in the wall of the large cyst, were found hyaline masses, in some cases ring-shaped or irregularly convoluted. These were probably obliterated vessels. The hyaline substance was of connective tissue origin. In it a few irregularly shaped compressed corpuscles were seen. This hyaline change was found also around the blood-spaces in the pedicle.

FIG. 5.



Section through cyst-wall.

a. Inner wall. b. Blood-spaces. c. Sclerosed tissue. d. Ordinary fibrous and muscular tissue.

No sign of myoma was seen anywhere in the uterine wall or in the cyst wall, with the exception of the very small polypus, the size of a pea, projecting into the uterine cavity. The uterine mucosa showed marked interstitial inflammation, the glands and lining epithelium being absent.

REMARKS.—It is difficult with accuracy to establish the seat of origin and nature of this cyst. Did it arise from the degeneration of a fibromyoma, or was it simply a formation in the wall of the uterus apart from tumor growth? Were the contents, primarily, blood, lymph, or myxomatous tissue?

In regard to the first of these questions, I may say that I am of the opinion that the cyst did not arise in a fibroid tumor. In cases of large tumors of the uterus hitherto described, *e. g.*, those of Sir Spencer Wells,[1] Fehling and Leopold,[2] Rein,[3] and others, there is no doubt as to the myomatous origin of the cystic growth; accompanying these there were fibroid growths in the cyst wall or in the uterine wall. The cyst was in these cases merely a degenerated tumor. Early cystic changes in fibroids have been noted by several observers.

In my case, apart from the small pea-like polypus projecting into the uterine cavity, there was not the slightest indication of myomatous formation. Neither did the cyst-wall nor the pedicle resemble a fibroid in structure. Yet this absence does not disprove the possible myomatous origin of the cyst. There may have been but a single fibroid in the uterus in which cystic degeneration might have occurred. If this be so, then the whole fibroid had disappeared and the cyst-wall represented the expanded and altered capsule of the tumor. There is, however, not the slightest evidence of any capsule-formation.

I can find no description of cystic tumors of the uterus (except hæmato and hydrometra, and distentions of remains of Gärtner's canal) except in connection with fibroids. These cysts contain blood, lymph, mucoid tissue, or the products of sarcomatous degeneration.

In the great majority of cases the fibroids have been of the subperitoneal variety, so that the cysts have been attached to the uterus by means of a pedicle. In a few instances there has been no pediculation. In the interesting case of Tillaux, already mentioned, the whole uterus seemed to be distended so as to resemble a hæmato or hydrometra, the cavity appearing to have become continuous with the fundal portion of the normal uterine cavity; it was shut off from the lower portion of the latter by several submucous fibroids.

In the next place as to the nature of the cyst. I think that there is a strong presumption in favor of its being an accumulation of blood. The contents removed at the operation consisted almost entirely of old broken-down fluid blood. The history points in this direction, though not conclusively. The tumor grew rapidly in the last few months, several attacks of pain and weakness having accompanied the increase. The patient believed that the trouble began about a year before her operation, after a severe strain from lifting, at a time when she had passed the menopause for two years.

It is very interesting that such a change should occur in a uterus two years after the change of life, when ordinarily it is atrophied, fibrous, and poorly vascularized. I think the explanation is probably that there existed in the fundus of the uterus a varicose condition or cavernous angioma, and that, owing to the sudden strain, rupture of a sinus-wall took place, leading to the formation of a blood-cyst in the fundus, which gradually increased in size.

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[1] Diseases of the Ovaries. London, 1872, pp. 194-199.

[2] Ein Beitrag zur Lehre v. den kystischen Myomen des Uterus. Arch. f. Gynaek., 1875, S. 531.

[3] Beitrag z. Lehre v. des lymphangiectatischen Fibromyomen d. Uterus in pathologisch-anatomischer in klinischer Beziehung. Arch. f. Gynaek., 1876, S. 414.

I have already pointed out the numerous blood-spaces in the wall of the cyst, as well as the angioma-like mass in the pedicle.

Cavernous angioma of the uterine wall was first described by Klob;[1] lately, Boldt[2] has described a most interesting case with great care.

A similar condition has, of course, been long described as occurring sometimes in certain fibrous tumors—the so-called *myoma teleangiectodes seu cavernosum* of Virchow.

It is well known that this condition may give rise to a large blood-collection in a fibroid, as in the case of Leopold,[3] and it is therefore not unlikely that a similar condition in the uterine wall might be followed by a cystic accumulation of blood.

It is known that a blood-collection may form in the broad ligament from the rupture of varicose veins in the broad ligament.

Possibly in this case the strain which the patient received in lifting may have led to rupture of the wall of one of the blood-spaces, the resulting swelling in the fundus becoming noticeable to the patient as an abdominal swelling about six months later.

A CASE OF PAPULO-ULCERATIVE, FOLLICULAR, HYPHOMYCETIC DISEASE OF THE SKIN; AN UNDESCRIBED DISEASE.

By Louis A. Duhring, M.D.,

and

Milton B. Hartzell, M.D.,
of Philadelphia.

C. S., a lad, aged fifteen years, a mill-hand, applied at the Hospital of the University of Pennsylvania for the relief of a patch of chronically inflamed, papular and papulo-ulcerative, slightly crusted lesions occupying chiefly one side of the neck. The disease had existed three years. The lesions composing the patch, he stated, underwent change from time to time, usually terminating in the course of several months in superficial atrophy of the skin in the form of slight, whitish, pitted, irregularly shaped scars. Itching was not complained of.

Upon inspection the disease was found to be peculiar, and a positive diagnosis could not be made. The patch resembled a mild expression of lupus vulgaris verrucosus more than any other well-known disease, and the indolence and slow course of the lesions followed by scarring helped to favor this view. There was no resemblance to acne, acne-cheloid, sycosis, or tinea sycosis. The regions invaded were the sides of the neck posteriorly, mainly the right side, and to a slight extent the flexor surfaces of the forearm. The patch on the right side of the neck (as shown in the photograph) was of irregular, rounded form, composed of numerous discrete and confluent, firm, irregularly shaped, dull-reddish, chronic papular, papulo-squamous, and papulo-crustaceous lesions. They manifestly represented different stages of the disease. Where several of these lesions were aggregated or confluent small patches were formed.

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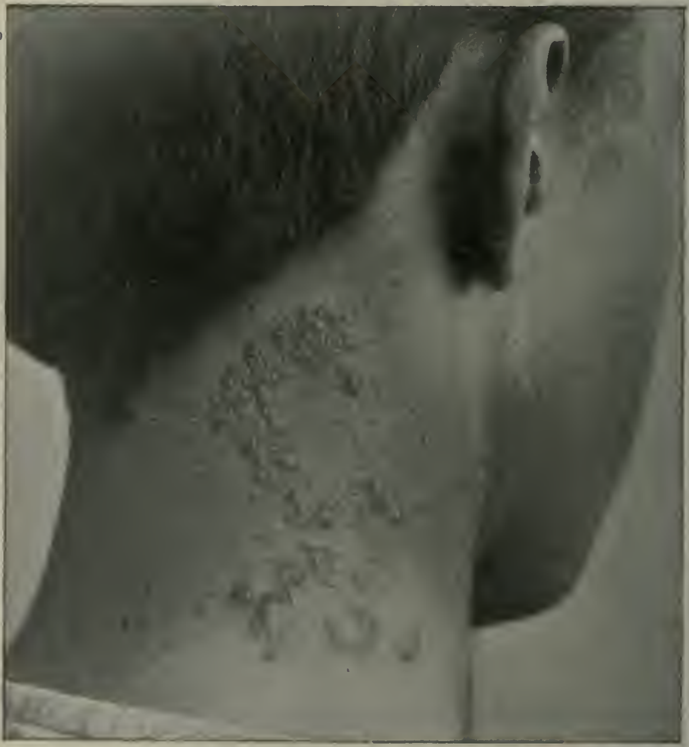
[1] Pathol. Anat. d. Weib. Sexual-Organe. Wien, 1864, S. 173.

[2] Amer. Journ. Obst., Dec. 1893.

[3] Arch. f. Heilk., 1873, S. 414.

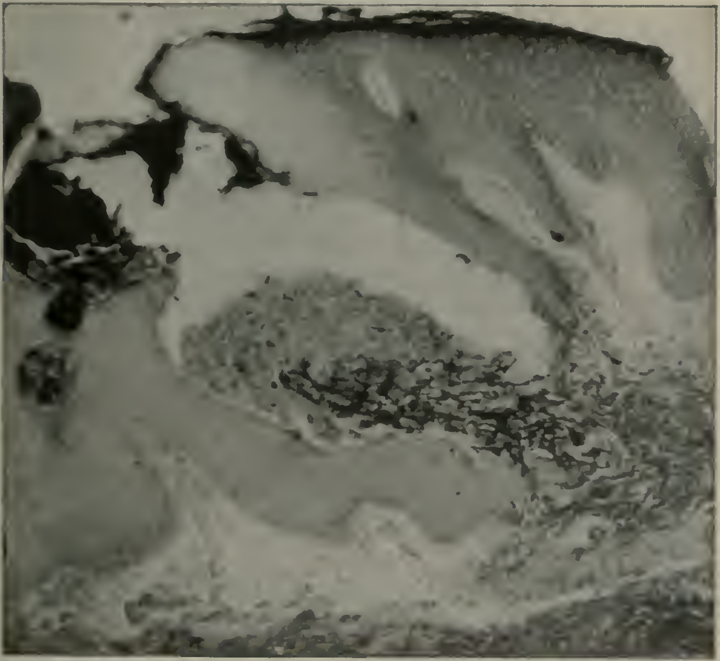
FIG. 1



Showing general character and distribution of lesions.

There were some discrete outlying lesions. In several localities a distinct crescentic configuration existed. To the hand the diseased area felt warty and rough, owing to the scales and little crusts on the surface of most of the lesions. Upon removing these, and they existed especially on lesions in an advanced stage, small follicular ulcers were noted. The follicular involvement, however, was not obvious to the unaided eye in all the lesions. That the process was a superficially destructive one was shown not only by the slightly crusted, pit-like excavations, but also by the presence of superficial, whitish, acne-like scars, which, upon the healing of the little ulcers, were left behind. These atrophic spots, varying in size from a pin-head to a small pea, were numerous and conspicuous, though nowhere were they deep. The central portion of the main patch especially showed these superficial scars. It was evident that the disease was extending on the periphery, but not regularly, and that the central portion had partially cleared away with scarring. But the extension was in no sense sharply defined or marginate, as in tinea circinata; nor was there anywhere any indication of a creeping or serpiginous course. It was, however, suggested that the disease might possibly be due to the growth of some fungus, perhaps the trichophyton, for one of us (Dr. Duhring) had seen a somewhat similar remarkable case many years before, occurring on the hands, which examination showed to be due to the trichophyton.

FIG. 2.

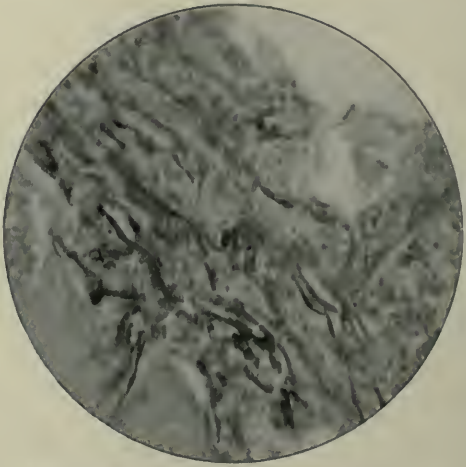


Follicle containing cellular débris and fungus (low power).

With the aid of cocaine anæsthesia lesions were excised from the patches upon the neck, fixed in alcohol, imbedded in paraffin and cut and mounted serially. Several lesions were thus examined, and the same alterations found in all. The rete mucosum was markedly thickened, the papillary layer was infiltrated with small round cells, and the papillæ were considerably enlarged. At the sides of the papules this enlargement was chiefly longitudinal, but in the centre the papillæ were both longer and broader than normal. Sections which passed through the centre of the lesions showed a large downward prolongation of the rete, which contained a cavity of considerable size, opening upon the surface.

This cavity, which occupied the site of a hair-follicle, contained a mass of round cells, granular detritus, altered epithelium, and, what was of most interest, a considerable quantity of mycelium and round and oval spores. The epithelium had disappeared at the bottom of the cavity in some sections, and the mycelium had broken through into the corium, growing between its fibres. In addition to this large cavity there were several smaller ones which did not communicate with the surface, but also contained fungus, together with granular matter. In a few sections isolated mycelial threads were seen growing between the fibrous elements of the corium at some distance from the cavities already described.

FIG. 3.



Mycelium at bottom of follicle. (Zeiss, D.D.: no oc.)

While this fungus resembled in a general way the trichophyton as seen in tinea tonsurans it differed from it markedly in size, being two or three times larger. The spores were about $\frac{1}{2500}$ inch in diameter, while the mycelial threads were from $\frac{1}{4000}$ inch to $\frac{1}{2000}$ inch in thickness. The mycelium was for the most part short, in a few instances branched and jointed, and commonly had club-shaped ends. The spores were few in number, the oval-shaped ones predominating. In sections stained with hæmatoxylon and eosin, and with Biondi's fluid, the fungus elements were, in the first instance, stained a bright rose-red, in the second, a purplish-red, in marked contrast with the tissue elements; in sections stained with alum-carmine the fungus remained unstained, showing as highly refractile threads and spores.

A CASE OF TRAUMATIC MENINGOCELE; OPERATION, FOLLOWED BY PERFECT RECOVERY.

By Howard Lilienthal, M.D.,
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On the 12th of August, 1893, Jacob F., four years old, was brought to my department of Mt. Sinai Dispensary to be treated for a swelling over the back of his head. Three weeks before he had fallen from a first-story window and had sustained a scalp wound. The boy was very dirty, and his hair was matted over a swelling as big as a duck's egg, which was plainly fluctuating. It was a busy day in the dispensary, so I gave the case to my assistant, Dr. D. D. Goldstein, for incision, thinking it to be an abscess under the scalp. Dr. Goldstein, having carefully shaved and scrubbed the part, noticed that something more than ordinary fluctuation was present, and called my attention once more to the patient. On questioning the boy's parents we then learned that he had been for a few moments after the accident unconscious, but that he quickly recovered himself and ran about as usual. He vomited once on that day, but had no convulsion or other suspicious symptom. For nearly three weeks the boy had been well except that an enlargement at the back of his head had been slowly forming. For two days before he was brought to me there had been persistent vomiting, but no other symptom. No chill nor fever had been noted.

Examining the patient very carefully, the swelling was found to be of a thick sausage-shape, running from the most prominent part of the occiput to the left and downward. It was fluctuating, softly pulsating, and could be partly reduced. It became tense when the child cried. When partly reduced, one could feel a crevice in the bone extending vaguely in the direction of the swelling. A fine sterile hypodermatic needle was thrust into the tumor, and clear, non-albuminous fluid withdrawn, about thirty minims in all. The diagnosis of traumatic meningocele was now considered practically certain, and the patient was transferred to my service in the hospital. For the following two days the boy's condition remained unchanged except that the vomiting temporarily ceased. The patient was irritable and apprehensive, crying whenever one but looked at him. On the 14th the tumor had become very tense, and the boy vomited his dinner, so three drachms of fluid were removed by aspiration.

On August 17th I operated. An incision was made around the tumor in the shape of a horseshoe, with the curve above and the pedicle below. I tried to separate the sac from the scalp, intending then to cut off the redundant portion, suture the stump and return it to the cranial cavity. The sac was so very thin and so adherent, however, that it burst at the first attempt. There was no shock, and the child bore the chloroform well, so the operation was continued. The fissure in the left parietal bone through which the meningocele protruded was now disclosed. It was about a quarter of an inch in width, and began quite abruptly about an inch to the left of the junction of the sagittal and lambdoid sutures, whence it extended downward and to the left parallel with the margin of the occipital bone and toward the mastoid process of the temporal for two and a quarter inches. Here the edges of the crevice came together, and the break extended farther as a closed crack, the end of which I did not deem it necessary to see. Looking into the fissure one could see apparently normal pia covering the brain. With a small sharp spoon I removed that part of the meningocele sac which covered the edges of the fracture, and at the same time thoroughly scraped the bone from inner to outer table, so as to excite new bone-formation. To protect the subdural space from infection a strip of iodoformized gauze was tightly packed into the crevice and was brought out at the left lower angle of the wound. The inner aspect of the scalp flap was now well scraped to free it from the adherent sac, and was sutured back into its old place with catgut. After the operation, which lasted about half an hour, the patient's pulse was 114, respiration 28; temperature 99.6° There was some general collapse, which rendered necessary a stimulating enema of hot water and an ounce of whiskey. Next day the boy's condition was good. Highest recorded temperature 99.2°. On the 20th patient vomited his supper. His wound was dressed the first time five days after the operation, and the deep packing of iodoformized gauze was removed through the angle of the wound. There was some stitch-hole suppuration, but not enough to interfere with the healing of the flap into its old position.

Subsequently the case progressed in an uneventful manner, and the boy was discharged on September 3d, apparently well.

On November 2, 1894, I again saw the little fellow, and there was a sound scar with not a trace of fissure or protrusion.

I have reported this case on account of its extreme rarity and to indicate a method of dealing with such conditions.

The reason for the existence of the meningocele I am unable to give. Fracture of the skull is a common enough accident, while traumatic meningocele is uncommon.

LEAD CONVULSIONS.

A STUDY OF SIXTEEN CASES.

By D. D. Stewart, M.D.,
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That convulsions may arise in the course of chronic lead-poisoning appears to have been recognized from the earliest times. About the middle of the seventeenth century, chiefly through the labors of Stockhausen, whose practice lay in a region of lead mines and whose acute observation led to the discovery of the cause of the "Poitou colic," which had been previously described by Citois without its cause being known, it became gradually recognized that cerebral disorders accompanying lead-colic had similar origin.

Most of the medical writers from this period to the time of Tanqueral intelligently mention the varied cerebral phases of plumbism. We owe, however, to the painstaking researches of the latter their first systematic grouping under the term encephalopathia saturnina. So elaborate were his investigations that his treatise on lead disease is still an authority, though published over a half century ago.

Little of recent literature, though including more or less elaborate descriptions of colic, arthralgia, and peripheral paralyses, notice at any length encephalopathy, dismissing it as a rare manifestation occurring solely among workers in lead; and modern writers, in enumerating the causes of certain cerebral disorders characterized by spasmodic disturbances or by loss of consciousness, almost wholly ignore the influence of lead in their production. Thus, Gray[1] makes the unqualified statement that certain groups of symptoms furnish *prima facie* evidence of specific infection. Among these he gives prominent place to "convulsions in the adult, which have not been preceded by convulsions in infancy, and are not of traumatic or of nephritic origin, or due to pregnancy or in an individual subject to migraine;" and further, "a comatose condition extending over days or weeks, not traumatic, meningitic, diabetic, nephritic, or from typhoid fever." Recently Althaus,[2] also in an elaborate paper on "Some Phases of Cerebral Syphilis," discusses freely the comatose variety of specific disease, without mentioning that the coma of lead encephalopathy presents somewhat identical phenomena. Were the assemblage of symptoms of specific epilepsy and coma as given by these writers alone relied upon, and a diagnosis of cerebral syphilis thus made, the result, if the case were one of lead encephalopathy, might be disastrous, since the management of the affections widely differ. This is especially true of lead convulsion when of precipitate onset and rapidly recurring; for though the iodides freely given in chronic plumbism appear sometimes to exert an effect almost as salutary as in tertiary syphilis, yet in the acute convulsions of lead-poisoning they are contra-indicated, releasing, as they are supposed to do, the deposited metal, permitting it to be carried to the nerve centres to aggravate the already existing danger.

The very high mortality attending acute lead convulsions, unless their early recognition leads to most energetic treatment, and the knowledge lately came to us that they are by no means limited to occupations in which lead is used, and that, indeed, they have perhaps frequently occurred in past years in Philadelphia unsuspected,[3] and are, perhaps, now occurring in other cities in which the use of chrome-yellow as a food dye is permitted,[1] invests the subject with no little importance.

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[1] Syphilis of the Nervous System and its Treatment. Medical News, July 9, 1887.

[2] Medical News, October 16, 1886.

[3] When investigating the wholesale bun-poisoning cases occurring in Philadelphia in 1887, I was told by a thoughtful practitioner of many years' experience, whose clientele formerly lay in the northeastern district—in that part of the city in which all of the bun-poisoning cases I

Of the various forms of cerebral disorder produced by lead, conjointly designated encephalopathia saturnina, the convulsive is by far the most common. The convulsive variety forms two-thirds, if not more, of all cerebral manifestations, and has the highest mortality. The term *convulsions* is here preferably used to designate the cerebral spasmodic disturbances of plumbism, as one less open to criticism than *eclampsia* or *epilepsy*, since it includes all the various forms of convulsive disorder of lead origin. Our knowledge of the intimate pathology of lead convulsions is yet too slight to permit the assertion that they are always due to a primary morbid state of the brain, whether chemical, molecular, or molar. They are often so far eclamptic in character that they lack the preceding general tonic contraction which usually forms the first stage of ordinary epilepsy; and, like eclampsia, the seizures are usually prolonged and have intimately admixed alternating tonic and clonic spasms. Like eclampsia, too, peripheral impressions may be intimately concerned in their onset, if not in their causation, since they often occur during the violence of colic; yet, though reflex disturbances may excite them, their intensity, duration, and lethality indicate that their origin and continuance are most likely dependent upon a primary cerebral disorder.

A careful survey of the literature of lead convulsions and a review of the cases herein reported, which includes all forms hitherto described except the more rare hystero-epileptic type, have convinced me that it is impossible to make any clinically exact systematic grouping of the various forms as Tanqueral did. A rough division might be attempted into an *eclamptic* and an *epileptic* group were the former used as a convenient though loose designation for those forms of convulsions of symptomatic origin not of hysterical or strictly epileptic type. A number of cases that I describe might be so designated, and yet certain others identical with them in many respects as regards symptoms leading up to the seizures, in type as regards the latter, might be classed as epileptic, so that each form blends actually with the other. A distinct and highly important and suggestive class, however, does exist, of which I relate two instances observed by myself, in which the convulsions, though primarily symptomatic of lead-poisoning, indicative of changes so induced in the nerve centres, have become secondarily

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reported occurred—that for years the very high mortality attending eclamptic seizures in children, though the latter were carefully treated and were seemingly due to slight causes, had been to him a matter of surprise. He has had since little doubt that most of these were cases of lead-eclampsia.

[1] The unlicensed use in at least one other city of chrome-yellow as a confection dye would doubtless, if investigated, be found to throw light upon many cases of nerve disorder otherwise obscure in origin.

those of so-called "idiopathic"[1] epilepsy, the fit habit probably becoming engrafted upon an already inherently predisposed brain, or one so structurally damaged by saturninism as finally to succumb to its effects as regards healthy functioning. This is in accordance with our knowledge of the pathology of many cases of uncured "focal" epilepsy, or of organic leuetic nerve trouble, whether convulsant or paralyzant—after withdrawal of the primary cause—then, persistence of symptoms, as has been so ably pointed out by Hughlings-Jackson, usually signifies persistence of a residual or secondary cause, one originated by the primary irritant and of the nature of a high instability of certain cells, with constant proneness toward discharge. As I have elsewhere stated, cases of actual epilepsy of lead origin, though rare in literature, may be of much more frequent occurrence than is generally supposed.

The following are brief histories of the sixteen cases:

The first series comprise those in which inquiry would have readily shown the presence of some more common symptoms of plumbism for some time preceding or at least coincident with the onset of convulsions.

CASE I.—Annie H., aged seven years.[2] Source of lead, chrome-yellow buns. She ate of these almost daily for from four to five months before symptoms of poisoning occurred. Noticeably failed in health about the first of June, 1887, three weeks preceding the outbreak of convulsions. Then slight headache appeared, and continued with exacerbations and remissions, increasing almost daily in severity until about June 16th, when it became agonizing and was associated with severe colic, a heavily furred tongue, fetid breath, complete anorexia, nausea, frequent vomiting, and obstinate constipation. Pronounced colic lasted but three days, and without treatment gradually lessened, giving place on June 22d to very severe pains in the knees and ankles, and muscles, about these joints. Arthralgic pains were continuous, with violent headache, until the onset of generalized convulsions on the 24th. No swelling or redness accompanied the joint pains.

On the 23d she was stuporous, frequently shrieking with pains in the head; there were occasional twitching of muscles, with alternate trismus and grinding of the teeth. On the 24th the condition was unchanged until evening, when three violent, generalized spasms occurred, the first lasting five minutes, the second and third from half to three-quarters of an hour, with intervals of coma. From the morning of the 25th, when I first saw her with Dr. Helyer, to 5 A.M. on the 26th, the time of death, she was almost constantly convulsed, with continuous unconsciousness. The seizures on the night of the 25th, from being generalized, limited themselves to the limbs and face of alternate sides; toward the end the left side was alone convulsed, the right being apparently paralyzed. There was a pronounced blue line on the gums. The skin was markedly earthy yellow. The urine was free from albumin. Considerable fever was present the last few days.

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[1] Using the term in its conventional sense.

[2] Seen through the kindness of Dr. Helyer. This case was briefly referred to in my paper on the sixty-four cases of chrome-yellow poisoning, Medical News, December 31, 1887. Notable quantities of lead were found in the viscera by Drs. Reese and Leffmann. Medical News, August 22, 1887.

The following three cases were patients of Dr. A. A. G. Starck. They are the only ones out of the seven fatal cases of lead encephalopathy in Baker Palmer's family of which I have been able to get at all detailed histories:

CASE II.—Mary Palmer, aged eight years; died August 20, 1885. Source of poisoning, chrome-yellow cakes; period of exposure unknown. Patient was very pale and cachectic for some time preceding outbreak of convulsions. The first noticed symptoms attributed to lead appeared about ten days before death. During the first seven days there were pronounced and continuous colic, obstinate constipation, and frequent vomiting of a yellowish fluid. Convulsions, preceded by headache and stupor, appeared on the seventh day. They recurred frequently, with intervals of coma, until death. As lead-poisoning was not suspected in this case by Dr. Starck, a blue line was not looked for. Death was attributed to lepto-meningitis.

CASE III.—Emma Palmer, aged twenty years; died December 13, 1885. Source of poisoning same as preceding cases. Patient had been ailing a number of weeks before medical advice was sought. She had had several attacks of typical lead-colic. The last attack of several days' duration, and with continuous, very severe headache, immediately preceded the onset of convulsions on December 10th. Marked digestive disturbances accompanied the colic, such as fetid breath, anorexia, nausea, frequent vomiting, and obstinate constipation. The convulsions recurred at short intervals, until death on the third day; they were generalized, violent, and prolonged, and consciousness was not regained after their appearance.

In this case there was marked lead cachexia present. A blue line was also noticed. Two and one-half years after death the body was exhumed; lead was found in the viscera.[1]

CASE IV.—George Palmer, baker, aged twenty-two years. Source of poisoning, chrome-yellow cakes. Noticeable symptoms appeared immediately subsequent to decease of Case III. Lead cachexia and a blue line on the gums were present. The symptoms preceding the convulsions were much the same as in Case III., but of less severity. The first generalized convulsion occurred January 20, 1886, while he was at work in the bakery; it lasted half an hour, and was very violent. There were tonic and clonic spasms. Colic and headache, which had preceded for a short time, were more complained of immediately after. The second convulsion occurred three days later in the street. He was thought not to recover consciousness after this seizure. Others followed in quick succession. He was taken to the Philadelphia Hospital, and died there on the following day in a seizure. It was there certified that death resulted from ordinary epilepsy. Two and one-half years after death the body was exhumed along with that of the preceding case; as in it, lead was also found in the viscera.[2]

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[1] See Medical News, August 22, 1887.

[2] See report by Drs. Reese and Leffmann, ibid.

Case V.—Mrs. S., aged thirty years. (The history of this case is given in the analysis of sixty-four cases of poisoning by chrome-yellow dyed cakes. *Medical News*, December 31, 1887.)

Case VI.—Jacob Mattson,[1] aged fifty-three years; car-driver; temperate habits; no specific history. During a part of 1886 he ate daily for luncheon, for a period of about six months, a half-dozen of the chrome-dyed buns, purchased from Palmer's bakery, the source of the poisoning in the preceding cases. Prior to this he had had for nearly twenty years a chronic diarrhœa, which had been contracted in the army. This gradually ceased, obstinate constipation replacing it, with frequent attacks of typical lead-colic of great severity, usually lasting, remittently, ten days. These attacks were often associated with excruciating pains in the ankles, knees, hips, and elbows, which also occurred at times when colic was absent. Considerable headache developed and great muscular and mental depression. He was then noticed to have cachexia. A marked blue line was present, and the teeth were also greatly discolored by lead. Without then suspecting the source of his ailment, he ceased to eat the cakes for a time, for in abandoning his work as a car-driver he no longer had occasion to buy the bun lunch from the shop. Symptoms of lead-poisoning now gradually disappeared, and he once more returned to his former occupation, resuming, as he did so, from December, 1886, to April, 1887, the daily lunch of a half-dozen chrome-dyed buns. In the early part of 1887 arthralgia and colic, described as of unbearably severe character, reappeared. Colic was of such severity that it is said he would lie for hours upon the floor, tossing about and shrieking aloud for help, and at times even becoming unconscious from its violence. Vomiting was always a feature of the colic. The patient finally became much debilitated in mind and body, was morose, and acted queerly. Colic, arthralgia, and severe continued headache preceded for a few days the appearance of the first convulsion, which occurred on May 7, 1887. There was no aura; he became suddenly unconscious; had generalized muscular twitching, lasting about ten minutes, succeeded again by a general tonic, and that by a clonic convulsion, the whole duration about a half-hour. Stupor followed. When aroused from it he was mildly delirious for several hours. This was succeeded again by a second convulsion, and this by stupor, coma, or maniacal excitement. He had similar attacks on May 10th, 12th, 13th, 14th, 17th, and 20th, and five more at intervals of three to four days, the dates of which could not be accurately ascertained. From three to eight generalized convulsions occurred on each of these days similar to those narrated above. A stuporous, delirious state was constantly present on the intervening days. He was frequently so violent as to require restraint. An interesting feature of the case was the loss of all knowledge of time, the space of ten minutes seeming to him like hours. Colic and joint pains after the onset of convulsions were less marked. Headache, however, persisted. There was no amblyopia. The eye-ground was not then examined. Several months later, while lead symptoms were still present, œdema of the retina and choroid was found, but no changes in the optic nerve. The urine was throughout free from albumin. Lead was found in large quantity while the patient was taking potassium iodide.

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[1] I am indebted to Dr. John Thomson for this case.

CASE VII.—David F.,[1] chrome-yellow dyer; aged sixty-four years; of temperate habits; no preceding history of syphilis or epilepsy. Eleven years ago the patient was employed in a dye-house in which the color used for several months was exclusively chrome-yellow. His occupation was sieving the dry chrome. He thus constantly handled it, and the air of the room in which he worked was continually ladened with the dust. After two months' exposure cachexia, headache, colic, and arthralgia developed. He was then compelled to abandon work from mental and physical disability, without being aware of the nature or source of the symptoms. Cerebral disturbances were then more marked than colic and arthralgia. Headache became constant and distressing, with nocturnal restlessness, insomnia, and delirium. There was complete failure of memory, even inability to recall the spelling of his name. In the midst of these ailments, three weeks after work was abandoned, an epileptiform convulsion occurred, lasting about an hour. In it he was constantly convulsed, and frothed at the mouth; unconsciousness and a cry preceded, and stupor followed the seizure. On the third day he had a second convulsion. Under prompt treatment the seizures then ceased. In a short time he then returned to chrome-sieving. After a renewed exposure of three weeks, the symptoms narrated above reappeared with increased severity. He had from six to ten prolonged epileptiform seizures, at intervals of two to three days. He could tell the immediate approach of a convulsion, but cannot now describe the actual form of aura experienced. Active treatment checked the seizures. Work in the dye-house was now finally abandoned; a gradual recovery then followed. No convulsions have since occurred. The urine was free from albumin at the time of the seizures. A blue line was present in the gums. The gums when examined by myself in 1887 still showed a faint bluish discoloration, were much retracted from the teeth, and bled easily on slight friction.

It is interesting in this connection to state that a boy who worked in the same room, and whose duty it was to scatter the chrome-yellow on a sieve, died in convulsions at the time D. F. was affected.

CASE VIII.—Sheridan D., aged forty-five years; carriage-painter for twenty-eight years. No syphilis. No family history of epilepsy or of any neurosis. Habits temperate. Had had occasional attacks of lead colic and arthralgia for twenty-seven years, the first symptoms appearing about a year after he began work at his trade. For a number of years he had had more or less severe frontal headache and was very dyspeptic. On March 1, 1886, he had the first convulsion. Pronounced headache, worse at night, preceded. A feeling of nervousness and dread occurred as an immediate warning of the seizure. He became suddenly unconscious and fell to the ground while on the street. A companion noticed that there were at first tonic, followed by clonic spasms, apparently resembling an ordinary epileptic attack. Stupor followed the seizure. On the following day he was well. He had no recollection of what he did immediately subsequent to the seizure; was told that he acted queerly, and that a few hours after the first convulsion that a second similar in character to the first occurred. A third convulsion, also identical with these, happened seventeen days later. Headache and slight colic preceded. For some months previous to these seizures his left hand and forearm had felt numb, and at times were the seat of a tingling sensation. There seemed to be slight loss of power at that time not evident when examined later.

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[1] I am indebted to Dr. W. H. Bennett for the history of this case, and for permitting me to see the patient.

Two other generalized convulsions occurred a few months apart, shortly after the first three. He was then given potassium bromide and iodide in full doses. These he took almost daily for two years. The bromide was then taken alone once or twice daily, with occasional intervals of two weeks. Up to the time he was last seen (January, 1891) the attacks of major spasm had not recurred, though he had had a number of slight spells of the nature of petit mal. He was then doing but little carriage-painting.

This case is of special interest because of the absence of pronounced symptoms of lead-poisoning, causing its nature to be overlooked by several physicians, among whom was a neurologist of some note. Though there was no indication past or present of specific infection, by exclusion, lead-poisoning not being considered in reaching an opinion, a diagnosis of cerebral syphilis was made by the latter. I first saw the case in 1887. He was then recovering from an attack of lead-colic of six weeks' duration. There was an extensive blue line in the lower gum, and the teeth were much discolored with lead. His urine contained no albumin; an examination for lead was thought unnecessary, symptoms of poisoning by the latter were so evident.

In all of the preceding cases typical lead cachexia, colic, joint pains were present, and, in those examined for it, a blue line was found preceding the outbreak of cerebral symptoms, so that the diagnosis should have been a matter of comparative ease, though the source of poisoning in all save Case VII. was so unusual as at the time to escape the notice of the attending physician.

In the following series, though all gave evidence of more or less depreciation in general health, with sallow skin, suggestive of lead intoxication, and several showed digestive disorder, a lack of the common symptoms of plumbism preceding the outbreak of the eclampsia, and the unusual and at first unknown source of the poisoning, render the case not only obscure but unusually interesting from the standpoint of diagnosis.

Case IX.—Mary D., aged five and a half years, one of seven children, all in good health at the time of illness in this case. No convulsions; no neurotic family history. In December, 1886, had a mild attack of pertussis, the terminal stage of which was present at the date of the appearance of the convulsions. The spasmodic element had been so slight from the first that the nature of the cough was doubted and no physician consulted. She had not been confined to the house, and ate with the family. For a few days preceding the outbreak of the convulsions it was noticed that she was restless and sleepless at night, and through the day frequently vomited what was thought to be bile. The parents thought the symptoms represented a mild digestive disorder. Constipation had not existed. Convulsions appeared on January 8, 1887; they were violent, long continued, local, tonic and clonic; the tongue was frequently bitten. All measures adopted to check the spasm were unavailing. There were at least thirty-five general convulsions. Death ensued in eight hours subsequent to the first seizure. The case was reported to the Coroner by the physician in attendance, as it came under observation within twenty-four hours of its decease. No autopsy was made. Source of poisoning, chrome-yellow buns; the patient's diet had consisted almost exclusively of them for a period of two weeks prior to death.[1]

Case X.—Louisa D., aged three and a quarter years, sister of the preceding case, had a mild attack of pertussis at the time convulsions appeared. A slight whoop was first noticed in the cough about January 10, 1887. On January 23d she complained of not feeling well, and had several spells of vomiting, repeated on the following day. On the afternoon of the 24th, while about the house, shortly succeeding an exacerbation of cough, she complained of nausea, and called for a vessel in which to vomit. During emesis, convulsions appeared which continued, with brief intervals of stupor, until death occurred within twelve hours after the first seizure. Treatment by full doses of potassium bromide and chloral, instituted by the physician in attendance, was of no avail. The bowels were believed to have been moved daily. They were open on the morning of the 24th. It was recalled by the parents some time after the death of this case and that of the preceding, that each for a few days preceding the appearance of convulsions complained occasionally of "stomach-ache." It was probably of no severity, as no relief was sought for it. Case X. was said to have lost color about two or three weeks preceding death. She ate the poisoned buns largely for about thirty-two days before the onset of convulsions.[2] Death was attributed by the physician in attendance, as in the preceding case, to simple eclampsia. No necropsy. Five months later the body was exhumed. Lead was found in notable quantity in viscera.[3]

Case XI.—William D., aged fifteen months. (This case was reported in "Notes on Some Obscure Cases of Poisoning by Chrome-yellow," *Medical News*, June 18, 1887.)

Case XII.—Lewis D., aged seven and a half years (for history see *Medical News*, June 18, 1887).

Case XIII.—Mrs. D., aged thirty-seven years; mother of Cases IX., X., XI., XII., XIX. At the date of eclamptic attack she was in the eighth month of gestation. Had always been healthy, though during the three preceding pregnancies had noticed, as in this one, some swelling of feet and ankles. She had never had a convulsion of any sort until April 24, 1887. For the space of a week or two preceding this there had been present supraorbital pains and sensations of numbness and tingling in the feet. The bowels were somewhat constipated. Urine was normal as to quautity and specific gracity, but contained $\frac{1}{6}$ per cent. albumin. Quantitative examinations for urea were not made.

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[1] See my paper "Notes on Some Obscure Cases of Poisoning by Lead Chromate," Medical News, June 18, 1887; for detail of points relating to discovery of source of poisoning and period of exposure, see my report on "A Series of Cases of Poisoning by Chrome-yellow, used in Coloring Buns." Transactions of the Pennsylvania State Board of Health, 1887, p. 293, *et seq.*

[2] The calculation was made from the time the family first began purchasing from the baker, whose specialty was fancy cakes and tea-buns. It is stated that these last, which were very highly colored with chrome-yellow, formed, with milk, almost the sole breakfast and supper of all the family save the father, who alone escaped poisoning.

[3] See report by Drs. Reese and Leffmann, before referred to.

On the morning of April 24, 1887, while at work about the house and feeling quite well, she was suddenly seized with a severe epileptiform convulsion lasting ten minutes. After an hour's interval, during which she lay in a semi conscious state and vomited a great deal of bile, a second convulsion occurred, which continued, with very slight intermissions, a half-hour, followed by an attack of maniacal delirium of three hours' duration. Very prompt treatment brought her about, and the convulsions were not repeated. She was placed in recumbency, upon an exclusive milk diet, and went to full term without accident.

The convulsions are thought to be undoubtedly plumbic in this case, because of the knowledge of the ingestion of lead; the appearance of convulsions at the time the other members of the family were similarly affected; the presence of certain other signs of plumbism, such as a slight though undoubted blue line in the edge of the gum about the lower central and lateral incisors; the continuance of headache, and the persistence of pains in the joints and of anæsthesia in the extremities for a considerable time after delivery, when albumin had entirely disappeared from the urine.[1] As is stated above, the urine was normal in quantity and in specific gravity prior and subsequent to the attack. It was not then examined for casts. Examinations were made later, while a trace of albumin was present, with negative result.

Case XIV.—Amelia D., a finely developed girl of twelve years, daughter of Case XIII. For several months preceding the outbreak of eclampsia she became debilitated and anæmic. Her color, which previously had been good, grew of a decidedly earthy hue. There were restlessness and sleeplessness at night, and a light, cheerful disposition gave place to moroseness and taciturnity. No complaint of illness was made until several days prior to May 12, 1887, the date the convulsions appeared. She theu seemed listless and despondent, and complained of severe headache and of feeling "bad all over." She had frequent spells of weeping when alone. There were nausea, complete anorexia, heavily coated tongue, and a very fetid breath. On May 11th the headache grew intense. It was located principally in the frontal and occipital regions. There were constant slight nausea and occasional vomiting of a greenish-yellow biliary fluid. She was seen professionally for the first time on the morning of May 12th; had passed a restless, sleepless night, the headache continuing and increasing in severity, and now for the first time she complained of pain in the knees and ankles, which showed no evidence of rheumatism. The breath was highly offensive; the tongue very heavily coated, particularly at the posterior portion. The fusiform papillæ were prominent, and the tips along the left lateral edge were of a deep black color. There was a blue line in the margin of gum in the lower central and lateral incisors. Nausea was constantly present, and while I was examining her she vomited considerable bile. Temperature was 99°; pulse 130; respiration not accelerated. The bowels were stated to have been moderately well opened daily. Colic was not present, nor tenderness on pressure over the abdomen or along the nucha or spine. Urine was free from albumin. A calomel purge was administered, followed by a saline. Two loose, exceedingly fetid passages occurred in a few hours. Chloral and potassium bromide were then given in full doses to alleviate headache and restlessness, which increased notwithstanding. Vomiting continued at intervals through the day. At 11 P.M., shortly after vomiting, a severe general convulsion occurred, lasting about fifteen minutes, succeeded by unconsciousness, from which she could not be aroused. A second seizure similar to the first followed in less than a half-hour, preceded by grinding of the teeth and great restlessness, coma continuing. Morphine and atropine, in combination, were twice administered hypodermatically. Full doses of chloral and potassium bromide were given by the mouth. When seen early the following morning the convulsions had not recurred. She had had a restless night. Headache was now even more severe than on the preceding day. The tongue continued heavily furred and the breath offensive. Five grains of calomel were given, but without moving the bowels. A large blister was applied to the nucha, coincident with the raising of which the headache somewhat ameliorated. A chloral and potassium bromide mixture which had been ordered to be continued through the day was, through an oversight, not administered. The convulsions recurred at 5 o'clock the same afternoon, and continued at frequent intervals until death on the following afternoon—May 14th. The spasms were frequent and generalized until four hours preceding death, when paresis of the left arm and leg occurred. They were then confined to the opposite extremities, but especially to the arm and face. The pupils were moderately contracted and insensible to light. Stertor and coma succeeded the spasms. At times intense restlessness was present in the intervals. Consciousness was entirely lost with the onset of the first seizure, and not again regained. Œdema of the lungs, bronchi, and trachea developed seven hours before death. Profuse moist rales were then present in the chest and throat, and frothy mucus, blood-streaked from the bitten tongue, appeared at the mouth and nose with each expiration. A half-hour preceding death stertor gave place to well-marked Cheyne Stokes' breathing. The temperature, which was normal at first, subsequently was not found to exceed 102½° F. It was not taken within two hours of death.

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[1] A history of this case, eighteen months subsequent to the date of the convulsions, was published in Medical News, January 26, 1889. She has since borne another child without complications. She and the three surviving children who were poisoned have, since recovery, remained in good health to the present.

All efforts to control the seizures after they became continuous were unavailing. Chloral and bromides were given freely by mouth and rectum, and ether inhalations were practised from the first with the onset of each convulsion, and occasionally amyl nitrite was used. Hyoscine hydrochloride was given subcutaneously after the failure of chloral and bromides, but it was not repeated, as the frequency of the spasms seemed to increase under it. Ice was applied to the head where the latter seemed hot. The blistered neck was not permitted to heal. Counter-irritants to the legs were without influence. An unsuccessful effort was made to move the bowels on the 14th, by the administration of three drops of croton oil; this not acting, two large stimulating purgative enemata were given. These were not rejected.

The brain weighed 53¾ oz. av. The brain and meninges were congested. The fibrous tissue about the base, and particularly in the neighborhood of the straight sinus, was thickened. The lateral and fifth ventricles were somewhat dilated and contained more than the average amount of fluid. Microscopically many of the arterioles showed irregular dilatations. In the cerebellum the corpus dentatum was ill-defined and, in parts, thickened. Lead was found in the spinal cord and kidneys, the only viscera examined for the metal.

The following cases are of distinct character from the preceding. They are best described as those of lead epilepsy.

CASE XV.—John K., aged thirty years, journeyman baker. Prior to July, 1887, when he first came under my observation in the medical clinic of the Jefferson Medical College Hospital, he for several years had worked in a bakery where chrome yellow was used as a cake-dye, and had himself been a free eater of the products of the shop. So far as he could tell, the family history was negative as regards neuroses or epilepsy. He had never had a convulsion until this time. He had led a temperate life and had not had syphilis. The first epileptic seizure occurred in the summer of 1884, while he was at work in the bakery. After three years he could not recall that he had had any remote or immediate warning of the attack. The seizure apparently presented the phenomena of ordinary idiopathic epilepsy. He fell with a cry, grew stiff, and then was generally convulsed, frothing at the mouth. The tongue was bitten. The duration of the seizure was about five minutes. It was followed by a deep sleep lasting several hours. Since the first seizure similar ones have occurred irregularly, sometimes almost daily, for two or three weeks, and then the intervals were three months. Recently, shortly prior to July, 1887, nocturnal seizures had replaced the diurnal; but occasionally minor attacks occurred through the day. There was nothing in his appearance, when seen in 1887, to suggest especially lead-poisoning. The skin was sallow, but a saturnine cachexia was absent. There was a purplish line in both gums. He was dyspeptic, and had had at intervals during the preceding three years occasional attacks of colicky pain, though not of the character of lead-colic. Constipation had been quite obstinate throughout the three years, and headache had occasionally occurred, the latter of more severity subsequent to than before a seizure. The knee-jerks were exaggerated. There was no evidence of any disorder of sensation or motility. Eye-ground was normal. Urine contained no albumin, but lead in large amount. He was under observation for a few weeks, and then ceased to return to the clinic. Subsequent efforts to discover his whereabouts have been unsuccessful.

CASE XVI.—Joseph D., aged thirty years, dye-handler.[1] No specific or neurotic history; habits temperate. When fourteen years old he began the preparation and mixing of various kinds of dyestuffs, among which were especially orange and yellow-chrome. His hands, face, and clothes were constantly stained with the colors, and the atmosphere of the work-room was often ladened with dust from the dyes. Convulsions appeared when he was seventeen years old, and have continued to the present. His health had been very good previous to the seventeenth year, although since he began handling dyes his skin had become sallow and his bowels obstinately constipated. The seizures presented all the phenomena of ordinary epilepsy; there is an aura, usually visceral, described as something rising from the stomach to the head; instantaneous loss of consciousness occurs when the sensation reaches the throat or the head. He then falls with a cry. The auræ are described as consisting of a smacking of the lips and efforts at swallowing, or in a sudden pain in both temporal regions, or in a feeling of sudden emptiness in the vertex. In a number of observed seizures there is a tonic contraction in which the head and eyes are rotated to the left, with complete or partial opisthotonus. This is followed by a generalized clonic spasm. The whole duration of seizure is from two or three minutes to ten minutes, followed at first by coma, and then by stupor or sleep, lasting two or more hours, after which he awakens with headache and dulness of mind. Maniacal excitement will sometimes precede and sometimes alternate the ordinary seizure. Suicidal or homicidal mania is then often shown. During the first three or four months after the onset of the epilepsy the intervals between the seizures were from two to five weeks; they then diminished to two or three days, and, after a year, the seizures often occurred from once to twice daily. This compelled him to abandon work, though unaware of any connection between his trade and the occurrence of the convulsions. The frequency of the fits now lessened, and at his twentieth year, when two years from his trade, the convulsions ceased, and none occurred for two and one-half years. He had then returned to the work of dye-mixing, and was as much exposed as before. The seizures now recurred with increasing frequency. He deteriorated so much mentally and physically that, in 1887, his mother removed him finally from work. He first came under observation in 1888 in the Jefferson clinic. I have followed his case up to two years ago. When he was first seen the fits occurred about every day or so. There was nothing in his appearance to suggest lead-poisoning, nor could I find by the most searching inquiry that he had ever had unequivocal symptoms, save perhaps obstinate constipation and attacks of slight ephemeral colic, which had been present from the time he began work in the dye-house. For a number of years he had had pains about the knees and ankles, along the spine, and in the shoulder-joints. They were of considerable severity, but lasted only a few days at a time. Apparently they were of the nature of lead arthralgia. His mental condition was very poor. The gums were much retracted from the teeth and bled easily on slight friction. There was a bluish-purple line in the upper gum. The teeth were much discolored, having on their crowns what appeared to be a deposit of lead sulphide. The tongue was flabby, heavily coated, and tremulous. The breath was highly fetid. The skin was sallow and cachectic. He suffered much from indigestion.

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[1] It is interesting to note that the father of this case was a block-printer, who made use of lead in his trade. He frequently suffered from lead-colic. His wife asserts that he died of Bright's disease, which his physician said had been induced by lead-poisoning.

The urine was examined several times by Dr. Leffmann, and lead found on each occasion—twice in considerable amount. There were no eye-changes.

At first, on full doses of potassium iodide and bromide, he improved and was able to work in a machine-shop. The improvement, however, was not long maintained. When seen two years ago the convulsions were as frequent and violent as formerly, and the mental condition showed even greater evidences of deterioration.

The duration of the period between first exposure to lead and the development of cerebral symptoms is a variable one, depending upon several factors, the chief of which are probably inherent susceptibility (age and sex) and severity of poisoning. In some cases convulsions may occur surprisingly early; in a less number their advent may be delayed for years, during which more or less constant symptoms of plumbism may be manifested. In one of my cases convulsions appeared on the fifteenth day after exposure; in thirty-two days in a second, thirty-three days in a third; a trifle less than three months in a fourth and fifth; four months in a sixth; four and two-thirds months in a seventh; about six months in an eighth, and in a trifle less than eight months in a ninth.[1] In a tenth, a coach-painter, in whom there were no indications of renal disease, the period of exposure extended over a period of some twenty years. In the remaining six I could not ascertain with certainty the exact intervals.[2]

Those of my cases in which convulsions appeared earliest were children. The instability of the nervous system of these naturally renders them the more susceptible.

It is generally thought that a more continuous exposure, which is equivalent to severer poisoning, is required to cause cerebral symptoms than to produce cachexia, colic, and arthralgia, the usual manifestations of plumbism; and for this reason Naunym[3] has asserted that cerebral accidents occur only among workers in lead, in those whose occupations favor a copious absorption of the metal. Bramwell[4] regards this as an important point in diagnosis. He states that he is unaware that cerebral accidents occur in plumbers, painters, and others who so commonly suffer from the milder manifestations of plumbism, but that they are limited to those employed in the manufacture of lead compounds. Though this is perhaps true in most cases, too great dependence upon occupation as a factor in diagnosis may readily lead to error. Cases have been recorded occurring in file-grinders, and Putnam[5] has reported several suggestive cases of epilepsy in the urine of which lead was found: the only discoverable source of poisoning in these last was drinking-water. Tanqueral, in France, found painters of buildings only less susceptible to lead encephalopathy than manufacturers of lead compounds. He recorded cases occurring among plumbers and painters. Numerous cases are also mentioned in current French and German literature occurring in painters and in glaziers of pots.[1]

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[1] This case (VII.), after two months' handling chrome-yellow colors in a dye-house, developed such pronounced symptoms of plumbism that he was compelled to abandon all work. There occurred colic, arthralgia, and headache. Within six weeks after a return to the same employment, after a four months' respite, he had convulsions coincident with the recurrence of other plumbic symptoms.

[2] In ten other cases (adults) reported in the past two decades by various clinicians—the only cases in which I have been able to find the intervals stated between first exposure and the appearance of fits—the interlapses are respectively: eighteen days, three months, nine months, three years (two cases), five years, twelve years, fourteen years, and seventeen years. So that convulsions appeared in twelve of these twenty cases within ten months, in four between two and five years, and in the remaining four between twelve and twenty years. It therefore appears that the majority of cases of plumbism that develop convulsions do so at a comparatively early period after exposure.

[3] Ziemssen's Cyclopædia.

[4] Intra-cranial Tumors, p. 129.

[5] Boston Med. and Surg. Journal, August 4, 1887.

None of my cases was engaged in the manufacture of lead compounds. One is a coach-painter, who for a year or so before the onset of convulsions used chrome colors. Two were handlers and mixers of chrome-yellow in a dye-house. Two were bakers who used chrome-yellow[2] freely as a cake-dye, and, unaware of its poisonous nature, ate the products of the shop. Poisoning in the remaining eleven occurred through eating the lead-dyed cakes. The fondness exhibited for the dyed buns by the poisoned was remarkable. Inexpensive in price, attractive and wholesome in appearance, they were often the staple food of many families at breakfast, lunch, and supper, and at these meals frequently replaced bread. As chrome-yellow was unsparingly used in their composition, it is not surprising that profound lead intoxication occurred early through their consumption.

It is well recognized that, preceding the development of the cerebral manifestations of plumbism, certain remote and immediate symptoms are common. When present, the assemblage of the former, representing at least such characteristic signs of lead intoxication as a blue line, cachexia, colic, arthralgia, or paralysis, prevents errors in diagnosis which might otherwise arise. Of Tanqueral's seventy-two cases of lead encephalopathy, exhibiting various forms of cerebral disorders, but six showed no premonitory symptoms. Out of twenty-eight cases of lead convulsions the histories of which are reported in the past two decades, colic is noted as preceding for a variable period in twelve. Colic was more frequently observed than paralysis or arthralgia, but was of less common occurrence than anæmia, the typical cachexia, and a blue line in the gums. The pre-existence of ordinary symptoms of plumbism apparently depends largely upon the duration of the period of exposure prior to the appearance of cerebral accidents. Should it happen, as is often the case, that convulsions appear early, only immediate if any premonitory symptoms may be looked for, except, perhaps, some anæmia and a blue line. In eight of the sixteen cases I here detail (Cases I. to IX.) the ordinary symptoms of lead intoxication were more or less decidedly evident for some time preceding the onset of the convulsions. All of the eight had colic. In most of them it was associated with frequent vomiting of a yellow-colored fluid resembling bile. In one of the eight (Case IV.) severe colic was not complained of until immediately succeeding the first convulsion. It then continued for two or three days, following which a second spasm occurred, rapidly followed by others. These continued until death. In another of the eight (Case V.) colicky pains rather than distinct paroxysms of lead-colic occurred. In this case attacks of nausea and vomiting were more prominent than symptoms of colic. Similar colicky pains, without any distinct attacks of typical lead-colic, occurred in one other of the cases (Case XVI.).

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[1] A most appalling series of cases of lead encephalopathy occurring in a pot-glazier's family was reported by Berger in the Berl. klin. Woch., March 16, 1874, and is worthy of mention in this connection. The poisoning occurred through handling the melted lead oxide used in glazing, and especially through constantly living day and night in the pottery in an atmosphere saturated with lead fumes. The father suffered from the comatose variety of lead encephalopathy. Seven sons and daughters died in lead convulsions: four other sons and daughters had frequent apoplectic and hemiplegic attacks of lead origin, and suffered from peripheral neuritis. All the children of their sons and daughters suffered from epileptic and choreic attacks, and several died between the ages of six and ten years in convulsions.

[2] It is of interest to note that the form of lead originating the poisoning in all the cases that I report, save, perhaps, Case VIII., was that technically known as chrome-yellow. The term *chrome-yellow* is generally, though very improperly, used interchangeably with *lead chromate*. These substances are not identical. A series of samples selected as being typical of good commercial chrome-yellow, obtained from various sources, were analyzed by William Glenn, a well-known Baltimore chemist. His results show that chrome-yellow is a very variable compound of lead sulphate, oxide, and carbonate. Efforts continued for nearly a year were resultless in finding a single sample of lead chromate sold as chrome-yellow. Samples of that used as a cake-dye in my cases contained 14 to 32 per cent. of lead chromate; 18 to 20 per cent. of lead sulphate, and 47 to 60 per cent. of white lead (lead oxide and carbonate). As to this point see Science, May 3, 1889, p. 348.

Very severe arthralgia was present in but two (Cases I. and VI.). In two others (Cases V. and VII.) joint pains, though more or less constant for some time, were of no great severity. As far as could be ascertained, vomiting and pronounced constipation occurred as a remote prodrome only in the cases with colic. As a precursor of convulsions, vomiting was present in several others who exhibited none of the more common symptoms of plumbism (typically Cases IX., X., and XIV.).

Paralysis of the extensor muscles of the forearm (wrist-drop) did not occur in any of the sixteen.

The blue line was presumably present in all. Circumstances did not permit a search for it in all of the sixteen. In those cases, however, in which an *intra-vitam* diagnosis was made the line was invariably found. In several in whom the poisoning was recent, unless on the watch for it, the line might have escaped notice, as it consisted of but a narrow bluish-black streak in the margin of gum about the neck of one or two bicuspids or an anterior molar.

Evidences of marked impairment of the general health, preceding for some time the advent of convulsions, were manifested by nearly all save those in whom convulsions developed very early after exposure. Many showed an earthy-yellow hue of skin. This was noticed in all of the bun cases. In Cases IX., X., XI., XII., and XIV., occurring in one family, the members of which had all previously been in good health, it was recalled by the parents that for days or weeks preceding the outbreak of eclampsia all had grown restless and sleepless at night, and were fretful and irritable by day. In all, too, without there being evidences of pronounced colic, indigestion was present, and in several colicky pains occurred. Disorder of digestion was especially marked shortly preceding onset of the spasms in Case XIV., and, to a less extent, in several of the others. In all the cases that I saw arising from eating the poisoned buns there were also present heavily furred tongue and offensive breath.

Most of the chrome-yellow-bun cases, of which an accurate history could be obtained, were noted to have had, for a day or so preceding the onset of fits, severe continuous headache, worse at night and associated with insomnia. In several, notably Case XIV., the headache was excruciatingly severe. With it vomiting was also frequent. In another (Case I.) headache was constantly present for three and a half weeks before the first fit, but was not at first unbearable. It however became so about ten days preceding the convulsions, and continued violently severe, with colic and joint pains, until the outbreak of spasms. Total failure of memory for two or three weeks preceding the outbreak of convulsions was a notable symptom in Case VII., the chrome-yellow mixer. He was cachectic and had had colic and arthralgia, which lessened with the onset of cerebral symptoms. He became unable to recall even the spelling of his name, and had severe constant headache, with nocturnal restlessness and delirium.

In several of the sixteen it was remarkable that no precursors were observed, except in two—vomiting. Case XII. was at play with a sister when the seizures occurred, which terminated fatally, despite active treatment, in twenty-eight hours.

It is regretted that in none of the acute cases of convulsions was an examination of the eye-ground made, so that the likelihood of the existence of optic neuritis, so commonly present in subjects of lead-poisoning with pronounced cerebral symptoms, can only be conjectured. The extreme frequency of the presence of optic neuritis in this class, associated with headache, vomiting, and convulsions, leaves little doubt of its probable existence, though undetermined, in those in whom the cerebral symptoms were severe. In but one of the four cases that I personally saw when convulsions were occurring was the examination feasible. In this, unfortunately, it was omitted.

As regards character of seizure, all of the sixteen, with the exception of Cases VIII., XV., and XVI., displayed more or less the usual pernicious tendency of acute lead encephalopathic seizures in frequency of repetition and lethality of termination. The most typical in respect to immediate precursors and character of seizure are Cases I., II., III., and XIV. These, in addition to premonitory headache, vomiting, and restlessness, and in Cases I., II., and III. to preceding colic and arthralgia, showed characteristically the above-mentioned tendency. This, without the premonitory symptoms, was also manifest in Cases IV., IX., X., and XII., the other of the eight fatal cases. In Case XII. the collective seizure forming what has been termed the *status epilepticus* lasted twenty-eight hours. At its termination, immediately preceding death, the axillary temperature, from the normal with the onset, rose to 107° F. A similar and indeed greater rise is not uncommon in the *status epilepticus* of idiopathic seizures, as was first remarked by Bourneville. In Case XIV. (sister of Case XII.), in which the collective seizure lasted twenty-three hours, the temperature did not exceed 102½° F. at death. In this case the premonitory symptoms were much more suggestive of an inflammatory cerebral disorder than were those of Case XII.

Cases XV. and XVI., as has been previously remarked, belong to a class distinct from the others. They are of unusual interest, suggesting as they do the likelihood of lead-poisoning sometimes originating so-called "idiopathic" epilepsy. These two cases are not unique. Putnam[1] relates several similar, as do also Schultze[2] and others.[3] Cases of this class may be of not uncommon occurrence. The multitudinous uses to which lead is put in civilized life—apart from the industrial sources of poisoning, the multitudinous accidental and unsuspected ones, a fraction only of which is generally known—render this metal the most ubiquitous and subtle of poisons. A consideration of the innumerable applications that are made of lead preparations may not infrequently throw light on cases of deterioration in health obscurely arising, and likewise, perhaps, sometimes explain the development in those with unstable nervous systems, and especially in the young, of convulsive disorders which, unchecked, eventually gravitate into ordinary epilepsy. There is no doubt that the convulsions of chronic lead-poisoning are sometimes mistaken for those of ordinary epilepsy, resembling the latter, as they may, in character and course. How frequently the error arises even systematic inquiry would still render it difficult to determine accurately. The resemblance between convulsions of lead origin and the so-called "idiopathic" epilepsy may be not only clinical but pathological. We dare not now infer, in the light of recent research, that the mere absence of detectable macroscopic and microscopic changes in the brain of an epileptic necessarily renders the epilepsy *idiopathic*, for in cases of lead encephalopathy terminating fatally the brain has been found to all appearances normal, and yet chemical examination has shown the most vital alterations in the gray matter, sufficient to cause the protean cerebral manifestations of plumbism. Instability of gray matter, its constant tendency toward discharge, the not unlikely cause of the phenomena of epilepsy, seems easy of explanation; though a careful consideration of the investigations of Blyth,[1] to whom we owe the knowledge of the important fact that the specific pathological cerebral effect of plumbism is not merely a structural change, but one of composition not detectable by ordinary means of pathological research—that it consists in a chemical combination of the lead in the brain with the complicated nitrogenous and phosphorized brain-fats, forming a definite substitution-compound to lead cephalin, in which a molecule of hydrogen is replaced by one of lead.

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[1] Loc. cit.

[2] Dissertation, Breslau, 1885.

[3] As regards the same class Gowers (Diseases of the Nervous System, p. 1265) states: I have seen several cases in which convulsions similar in character and course to those of ordinary epilepsy occurred in the subjects of lead-poisoning, without other symptoms, and continued for years after the toxic influence had ceased.

If there be nothing in the character of seizure in certain cases of lead convulsions to differentiate them from the fits of ordinary epilepsy, and the common symptoms of plumbism, as is often the case, be so slight as to escape notice, the observer not being especially on the watch, errors in diagnosis may readily enough occur. The oversight would be, of course, the more venial if, with lack of unequivocal symptoms and presence of obscure and unusual source of poisoning, the case came under observation years after development of the seizures. In Case XV., had I not at the time it presented itself known of the common use of chrome-yellow by bakers, I should not, of course, have especially suspected lead as a causative factor, although the age at which the epilepsy appeared, with a negative history of syphilis, renal disease, and of trauma, would, naturally, have led to an inquiry in that direction. In Case XVI. the convulsions began at the age at which the development of epilepsy is more common. With an utter lack of the more usual symptoms of plumbism, lead-poisoning would not have been suspected as a cause of the convulsions had not the customary inquiries, in developing the history, into various points that might seem to bear on the case elicited the fact already stated regarding exposure to lead in an occupation most liable to originate severe constitutional symptoms. Even then a connection of cause and effect could have been little more than conjecture, had not further inquiry brought out the additional fact of not only origin of fits after exposure, but their cessation on abandoning work, and, again, their re-development with renewed exposure. Systemic intoxication in this case must have been unusually severe, unless a second source of poisoning, though not evident, was present; since, though he had been absent from his trade for a year or more, lead was repeatedly found in the urine,[2] and twice in large amount, as such things go, when potassium iodide was taken freely with the object of eliminating the metal from the tissues.

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[1] Journal of Mental Science, January, 1888.

[2] All the urine examinations for lead were made for me by Dr. Leffmann, to whom I am under many obligations for the same.

REVIEWS.

Investigations on Microscopic Foams and on Protoplasm. Experiments and Observations Directed Toward a Solution of the Question of the Physical Conditions of the Phenomena of Life. By O. Bütschli, Professor of Zoölogy in the University of Heidelberg. Authorized translation by E. A. Minchin, B.A., Fellow of Merton College, Oxford. 8vo., pp. 340. Twelve lithograph plates. London: Adam & Charles Black, 1894.

It is but the natural outcome of the development of the biologic sciences that extensive series of facts regarding the structure and phenomena of living organisms having been accumulated, biologists should more and more turn their attention to the explanation of these facts. It is likewise eminently proper that each factor in the complex phenomena of life should receive careful examination in the light of the exact sciences of mechanics, physics, and chemistry before the biologist shall be called upon to say how far these phenomena may be attributed to the laws of physics, and at what point, if at any, some peculiar form of energy is to be called in.

It is only by establishing upon an experimental basis the explanation of fact after fact, according to known laws, that those vital phenomena may be isolated which demand the existence of some as yet not understood form of energy.

Twenty years ago Houghton pointed out many new and interesting applications of exact mathematical science to the problems of molar movements in animals, and expressed as the result of his studies his belief in a process of evolution of higher from lower forms of existence, according to fixed laws. Marey, Cope, Ryder, and others have since contributed much to the understanding of the mechanical origin of the hard parts of organisms, through the action of interference energies—molecular and molar movements—such as the physical tensions inherent in protoplasm along with other colloid fluids, and the effect of such agencies as impact, friction, and strain. Ryder has grouped these so-called "*kinetogenic*" and "*statogenic*" movements under a general form of energy which he terms "*ergogenesis*."

The emanation of heat, light, and electricity from living organic bodies has received careful study at the hands of various physicists, and the catagenetic processes involved in the elaboration of the carbohydrates, waxes, oils, alkaloids, and proteids, forming the proximate constituents of plants, and of the various secretion and excretion products of animal katabolism, have received most exhaustive attention from the physiological chemist and spectroscopist.

In no case, however, have these researches eliminated the necessity of recognizing the existence of some anagenetic or growth-force, some "vital" upbuilding energy, such as Cope includes under the terms "*bathmism*" and "*emphytism;*" for example, such a force as is exhibited in the "antichemism" of plants, *i. e.*, the energy which is displayed by the elaboration of living from non living matter. This is a constructive or anagenetic process employing the energy derived from the heat and light of the sun. It is at first confined to the single individual (*autobathmogenic energy*), proceeding as a higher manifestation, to embryo-building, to the formation of secondary organisms like the parent (*emphytogenic energy*). But the vital phenomena, which are commonly regarded as inexplicable in terms of physics, go beyond the upbuilding of living from non-living matter and the multiplication of the resulting organisms. These latter exhibit on every hand the influence of a growth-energy which is not exhausted by the formation and activity of the individual or species, but which tends constantly to a higher plane of structure and function through the subdivision and specialization of its action, due to special acquired arrangements and rearrangements of the molecules upon which it acts. This highest manifestation of growth-force is seen in the phenomena of evolution, and its various phases are marked by molecular attitudes or groupings, which remain unaltered so long as they keep well within the main axis or current of the growth-force.

It will be seen that there are two lines of biologic thought—the one dealing with a constantly growing list of structure and functional phenomena that may be accounted for under the laws of molecular and molar physics and chemistry; another constantly decreasing list of phenomena to be explained only upon the basis of some as yet not understood growth-force—the ultimate and essential force of life.

While man is constantly learning the properties, states, and relationships of matter which determine the possibility and degree in which this anagenetic force may manifest itself, he has never been able to imitate any of the anagenetic processes, and all attempts to demonstrate spontaneous generation of living organisms have been failures.

The gaze of the biologist, intent on discriminating between the essentially physical and mechanical processes of life and those requiring the action of a special growth-energy, is fixed steadfastly upon the living cell, and every contribution to our knowledge of the cell brings us to a better understanding of the nature and limitations of that growth-force which has, by one of our contemporaries, been deified as "Biologos."

The attitude toward these questions assumed by Prof. Otto Bütschli, than whom none is better fitted by training and experience to speak, is well defined in the following sentences from his masterly work, only recently made available to English readers: ". . . I am convinced that we shall get no farther in these matters by means of speculations upon attractions and contractions, or with the help of micellar and molecular theories; but that we must rather risk the attempt to advance upon the basis of the known phenomena of molecular physics. In any case, I think that by means of this work I shall establish the conviction that in living matter there are no mysterious forces at work, but only those which also prevail in the organic world" (p. 250).

Prof. Bütschli is well known as one of the most thorough students of the protozoa, living. For years he has been one of the most prolific contributors to our knowledge of protoplasmic organisms in their least differentiated forms, and the present work is an attempt to explain the structure and phenomena of living protoplasm on a rational basis capable of demonstration.

The work is divided into two parts, the first of which deals with the investigations upon oil foams and upon protoplasmic structures. The second part takes up the theory of the net-like or reticular structure of protoplasm, and ends with a most exhaustive summary of the divergent views.

It is impossible to present here any adequate idea of the interest with which the student of cell structure must read the accounts of Prof. Bütschli's success in manufacturing oil-lathers or foams,[1] small masses of which exhibit under the microscope the structure and behavior of protoplasm to a wonderful degree. His foam-drops show the alveolar structure of protoplasm, together with its cuticular layer, the granular appearance is imitated, and the granules stream about as in living protoplasm; they creep somewhat rapidly backward and forward under the cover-class; when free from pressure their activity is increased by warmth and electricity up to a certain point, and the direction of movement may be determined arbitrarily by the application of various stimuli to molecular activity, such as heat and substances possessing different surface tensions. The empty cells of thin sections of elder and sunflower pith, after being passed from absolute alcohol to chloroform, are filled with fine oil-foams, rendered transparent with glycerin, whereupon, "in successful preparations, it is then observed that the oil lather contained in each of the pith cells is in lively streaming which persists for hours." It is interesting to note that "nothing was ever observed of a rotational streaming such as occurs in vegetable cells;" the process observed was that commonly spoken of as circulation and so frequently demonstrated in the stamen hairs of tradescantia.

Nowhere is there available a more thorough digest of the conflicting views regarding the structure of protoplasm than is presented here. Only once or twice does Prof. Bütschli show any inclination to abandon the method of calm impersonal presentation, and show the fire of the advocate. Künstler seems to have aroused him considerably by criticisms of his previous comparisons of the structure of protoplasm with the structural relations of a foam, and Bütschli's retort is interesting as presenting his position:

"Any one who takes exception, at the outset, to all attempts to explain the various phenomena of life on the ground that such attempts are devoid of importance, because not made upon the living body or upon protoplasm, renounces at once all possibility of an explanation of these processes; he shows that he does not take their explanation seriously, but thinks it more correct to regard vital phenomena as the outcome of a secret and mystical cause which it is not permissible to touch upon. Whoever, on the other hand, does not share this point of view, will, as little as myself, be of the opinion that I had prepared living protoplasm by means of my experiments, but will admit that bodies were successfully manufactured which not only possess a great similarity to living protoplasm in their structural relations, but also offer certain peculiarities which hitherto were only to be observed in the same manifestation and for the same length of time in living protoplasm. To bring these results to bear upon the explanation of the phenomena exhibited by living protoplasm seems to me not only permissible but even imperative.

"Now, Künstler explains protoplasm not only as a living, but also as a 'highly structured' substance. In so far as this statement has reference to structural relations actually observed, and not to such as are supposed to be hidden from us, and to be necessarily connected with the mysterious life of this substance, I can by no means agree with it. Protoplasm, as far as our knowledge extends, is in no way more highly structured than foams artificially manufactured by me; and if it must of necessity possess a very high degree of complexity, it may be confidently predicted that this complexity is to be sought in the province of chemistry, as I have already attempted to explain elsewhere (1891). Finally, according to Künstler, protoplasm must be 'the result of a special development, which can have nothing in common with the mixtures prepared by me.' Now, I think that Künstler will find it difficult to reply if he were asked for a more precise account of this special mode of development, of which protoplasm is the result. I regret to say that I, at least, know nothing definite concerning any developmental history of protoplasm, although I am, of course, greatly interested in it. So far as I have heard, there has been much talk about the growth of protoplasm, and some hypotheses concerning it have been put forward, which, however, only deal with the mode in which complete molecules or micellæ of protoplasm are added to those already in existence; but, as I have said, I know nothing of any special mode of development of protoplasm which could be adduced in opposition to the validity of my attempts to explain certain phenomena of protoplasm."

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[1] Made of olive-oil, potash, soap, and glycerin.

Prof. Bütschli does not attempt to do more than he here indicates, "explain certain phenomena of protoplasm," and although the artificial imitation of the radial appearance in cell division and of karyokinetic figures strikes one as prophetic of what may yet be learned by the study of "the interaction of physical and chemical forces under definite conditions," there undoubtedly still remains a wide field for the "biologos" or bathmic forces of the biologic metaphysician.

In dealing with the subject of surface tensions we are surprised to note that Prof. Bütschli makes no reference to the interesting studies of Reinold and Rücker,[1] especially the paper "On the Relations Between Thickness and the Surface Tension of Liquid Films," although he frequently refers to Plateau and Van der Mensbrugghe, whose work is corrected and supplemented by that of Reinold and Rücker. The latter investigators show, by direct comparison of the tension of thick and thin films over a range of thickness extending from 1350 to 12 millionths of a micro-millimetre, that there is no evidence that any change in surface tension is dependent on the thickness of the film. In connection with the degree to which pseudopodia may be extended, Bütschli offers no suggestion, except the general statement that the currents in an amœba run "just as if an extension current existed as the result of the surface tension being diminished at the anterior end." This is in accordance with the law that the difference in surface tension in two parts of the same film must produce motion; but the distributing factor remaining fixed, what is to limit the forward motion? It seems that the increased viscosity,[2] due to stretching the cuticular layer; the fact that the thickness and surface tension of films appear to be affected by the nature of the gas with which the films are in contact; and finally, the fact noted by Sir W. Thompson, that a film is cooled as it is extended, may all have some effect in putting a stop to further changes in surface tension at the anterior end of the moving amœba or elongating pseudopod, and consequently to their movements.

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[1] Philos. Trans., Lond. 1881, vol. 172; 1883, vol. 174; 1886, vol. 177.

[2] When the thickness of a film becomes less than twice the radius of molecular action its viscosity increases. The magnitude of the radius of molecular action would appèar to be from 3½ to 7 millionths of a millimetre (micro-millimetres), judging from the fact that Reinold and Rücker show that the tension of a film, which is sensibly constant when the thickness exceeds 50 micro-millimetres, diminishes to a minimum, and begins to increase again when the thickness is diminished to from 14 to 7 micro-millimetres.

Not only does Bütschli show similarities in structure between his foam drops and protoplasm, but, after demonstrating "that the framework and the intervening substance of protoplasm must be fluid," as in his alveolated oil-lather drops, he goes on to point out the harmony of the investigations of Reinke and Rodeswald upon the enchylema squeezed out from *Æthalium septicum*, with his own conclusion, that the intrareticular substance must be interpreted as an alkaline watery solution; and he completes the chemical resemblance of his foams to living protoplasm by pointing out the probability that the foam-work substance of protoplasm is formed by a body which has arisen from a combination of albuminoid and fatty acid molecules, forming a body insoluble in water. The phenomena of chemotaxis as described by Metschnikoff and others would appear to have a direct bearing on this subject, but it receives no attention, although the much less important chemical hypothesis of Montgomery is referred to. C. S. D.

DERMATOLOGY: BEING VOLUME III. OF A SYSTEM OF GENITO-URINARY DISEASES, SYPHILOLOGY, AND DERMATOLOGY. By various authors. Edited by PRINCE A. MORROW, A.M., M.D. With illustrations. Pp. 976. New York: D. Appleton & Co., 1894.

THE contributors to this large, imposing, and valuable work on dermatology are writers well known to the profession in this department of medicine. New York City is represented by C. W. Allen, E. B. Bronson, G. T. Elliott, J. A. Fordyce, G. H. Fox, L. Heitzmann, G. T. Jackson, F. J. Leviseur, P. A. Morrow, H. G. Piffard, S. Pollitzer, and A. R. Robinson; Philadelphia, by M. B. Hartzell, H. W. Stelwagon, A. Van Harlingen, and E. J. Stout; Chicago, by J. N. Hyde and J. Zeissler; St. Louis, by W. A. Hardaway and C. F. Hersmann; New Orleans, by H. W. Blanc, I. Dyer, and R. Matas; Boston, by J. T. Bowen; Cleveland, by W. T. Corlett; Montreal, by F. G. Shepherd; and Toronto, by I. E. Graham. These names are all everywhere favorably known in connection with dermatology, and, as a matter of course, command a respectful hearing on the subjects discussed.

The scope of the work as planned by the accomplished editor is on broad lines, the subject-matter and its arrangement being entirely in accord with modern advanced views. The classification of the diseases rests upon a solid foundation, its basis being pathology. Thus Class I. is "Inflammations," including the exanthemata, eczema, and the numerous other diseases of a manifestly inflammatory or exudating nature usually included by authors in this class. Class II. comprises "Hemorrhages;" Class III. "Hypertrophies;" Class IV. "Atrophies;" Class V. "New Growths;" "Class VI. "Neuroses;" Class VII. "Diseases of the Appendages of the Skin;" and lastly, Class VIII. "Parasitic Diseases." This classification is not only scientific, but is of practical use in grouping the numerous diseases of the skin. Viewed as a whole, we are of the opinion that it is difficult to devise a more useful scheme. Up to the present time it has been impossible. It is based upon the old and valued Hebra classification, which has done such good service the world over for the study of these diseases. The weakest part of the structure is the last class, Parasites, which should be omitted, and the subject-matter treated elsewhere.

The volume opens with an excellent chapter on the anatomy and physiology of the skin, by L. Heitzmann, favorably known for his many contributions to the histology of the skin. The illustrations are original, well drawn, and serve to make the text much clearer than could be done without them. We take it they are from the pen of the author himself. The chapters on general semeiology and classification are contributed by Dr. Morrow, and those on general etiology and diagnosis by Dr. Hardaway.

Coming to Part II., Special Diseases, we first meet with the exanthemata, both systematically and fully dealt with by Dr. Graham. They are discussed in a scientific and satisfactory manner. Dr. Piffard, well known for his original contributions to American dermatology, is the author of the chapter on eczema. Considering the frequency and importance of this disease (constituting between thirty and forty per cent. of all the affections of the skin), the space allotted to it is remarkably little in comparison with that which certain other rare diseases receive. Thus, about thirty pages are devoted to eczema, and half as many to dermatitis herpetiformis, one of the rarer diseases. This apparent scantiness, however, is compensated for by the fact that all Dr. Piffard writes is not only very concise but practical. It is impossible more than to allude to one or two of the questions discussed in this chapter. One that strikes us as being worthy of special remark is "eczema of the sebaceous glands," where the author states that under the influence of the stimulus of eczema the glands may exhibit increased functional activity, and the eczematous exudation become mixed with a sebaceous secretion. This condition, the author adds, must not be mistaken for a totally different affection which has received the name of "eczema seborrhoicum," which, in his opinion, is not an eczema at all, nor in any way connected with it. With this opinion we would express ourselves as in accord. The pathological anatomy of eczema is briefly considered by Dr. G. T. Elliott. The treatment of the disease receives due attention, and will be found quite full enough to meet the needs of the practitioner. Mention may be made of the treatment of chronic eczema of the palms and soles by the application, every few days, of the strong (25 per cent.) solution of peroxide of hydrogen, which Dr. Piffard recommends highly. Internally, the most benefit is to be derived from the proper use of arsenic, calx sulphurata, and viola tricolor, indications for the administration of which are given.

With the title dermatitis seborrhoica Dr. G. T. Elliott discusses at length Unna's "Eczema Seborrhoicum," and who, while agreeing almost altogether with Unna's claims in regard to the disease, would deprecate the name eczema being attached to it.

Dermatitis herpetiformis receives full and critical consideration at the hands of Dr. Stelwagon, ample justice being done to the subject. Several typical cases are narrated, which serve to accentuate the characteristic clinical features of this somewhat rare disease, now generally recognized everywhere.

One of the most elaborate and lengthy chapters is on leprosy, by Dr. Morrow, who has had unusual opportunities for studying this disease in the Sandwich Islands, as shown by the numerous excellent original photographs which illustrate the article. With these photographs before him the medical man who had never seen a case could scarcely fail to recognize the disease. All the commoner varieties and stages are represented. A photograph by Fordyce shows the bacillus *in situ.*

Among the newer and rarer diseases we note an article by Fordyce on "Multiple Benign Cystic Epithelioma," well illustrated. This disease has been much discussed of late, especially abroad, cases having been reported with various titles, too numerous to quote here. It was thought by many to be a new growth starting in the sweat glands or ducts, but Fordyce believes the formation to be due to masses and tracts of epithelial cells corresponding to those in the lowermost layer of the epidermis and the external root sheath of the hair-follicle.

Another new disease of much interest is keratosis follicularis, which receives consideration from Dr. Hartzell, who is not disposed to accept without further confirmation the view held by many observers that the bodies met with in the tissues are really coccidia. Paget's disease of the nipple is also ably and conservatively handled by Dr. Hartzell, the article having the merit of being concise.

Dr. H. W. Stelwagon writes on molluscum contagiosum, stating his belief in the contagiousness of the disease, and that the cases which have come under his personal observation would go to support this view. The true or exciting cause of the growths, he believes, has not yet been discovered, the psorosperm theory not being proved.

A lengthy and elaborate chapter is given to tuberculosis of the skin, miliary tuberculosis of the skin, lupus vulgaris, tuberculosis verrucosa, and scrofuloderma, all from the pen of J. T. Bowen, and discussed mainly from a scientific standpoint, with the microscope as a foundation. These affections are all regarded as manifestations of tuberculosis. Scrofuloderma is looked upon as a tuberculosis of the subcutaneous tissue, but no mention is made of some of the well-known clinical forms of scrofuloderma which have not only their beginning but their termination in the skin, in no degree involving the subcutaneous tissue, as for example the scrofulous, flat pustule met with chiefly on the trunk and limbs.

Another lengthy chapter is devoted to epithelioma, by Fordyce, the disease being presented in all its details, especially as concerns the pathological anatomy. It is, moreover, illustrated by some excellent photographs. Sarcoma is also considered from a broad position. These two chapters, indeed, are remarkably complete, and in their fulness quite overshadow some of the other perhaps equally important diseases. But discrepancies of this kind are unavoidable in a work the conjoint production of many authors.

In a work which in other respects is a complete treatise on cutaneous diseases we miss any reference to the syphilodermata. This apparent omission, however, is readily explained by the statement that diseases of the skin due to syphilis are treated of in the volume of the work devoted exclusively to syphilis. At the same time it cannot be denied that the syphilodermata are as much entitled to consideration with the other diseases of the skin as are the tuberculous affections or the scrofulodermata; both are cutaneous expressions of a general disease. Syphilis in all its cutaneous manifestations, from the chancre to the tubercle, belongs properly to dermatology. All lesions that affect the skin, irrespective of cause, should come under dermatology.

Alopecia areata, a disease about which much has been written of late, more especially as concerns its possible or probable parasitic nature, is by A. R. Robinson, who is eminently qualified to discuss the pathology of this disease. He holds that all cases of alopecia in which the patches increase in size by peripheral extension are parasitic, as shown by the anatomy, especially by the inflammatory process in *areas*, at the same time not denying that hair may fall out in consequence of injury to the nervous system. With the exception of general alopecia from shock, he is inclined to believe that nerve disturbance is only a predisposing factor. Such views, we hold, are not altogether in accord with clinical facts, and should not be allowed to pass without a word of protest. There are doubtless causes capable of producing this disease of the nature of which we are ignorant; but to assume that the cause is parasitism, without any observer being able to demonstrate the parasite, is, we think, a premature conclusion. In the treatment parasiticides are practically of no more value than other irritant remedies.

We find urticaria removed from its usual place in classification with the erythematous diseases, and grouped with the sensomotor neuroses. It is described by Bronson, who has done so much to elucidate the subject of the sensory neuroses generally, especially pruritus. This latter disease is also written by him. All are instructive and valuable dissertations on this group of diseases.

S. Pollitzer contributes several well-prepared articles on diseases of the sweat glands, a subject which has heretofore received but little attention among dermatologists, as a recent critical review of the literature by Petersen in the *Archiv für Dermatologie und Syphilis* shows. In Pollitzer's articles special attention is given to the diseases characterized by structural changes in the glands and excretory ducts, such as hidradenitis and miliaria.

The vexed question of seborrhœa is discussed by Dr. Elliott, who, with some other dermatologists, finds it difficult to decide upon a definition of that disease. On the whole, the author finds himself very nearly in accord with Brocq's definition, in which seborrhœa is held to comprise certain affections characterized by disturbances in the secretions of the cutaneous glands, the products of which, mixed with epidermic cells, either concrete upon the surface of the skin or cover it with an oily coating. Elliott would exclude from the category of seborrhœa the variety known as S. sicca, the S. oleosa of the Austrians and the acne sebacée fluente of the French being the representatives of true seborrhœa.

Diseases of the nails, a difficult subject to handle, are ably considered by Drs. Van Harlingen and Stout conjointly, these authors also contributing practical and satisfactory chapters upon tinea favosa, tinea tonsurans and other tineæ, the pages on treatment being especially full. The affections of the hair are written by Dr. G. T. Jackson, a well-known authority on this subject.

The volume closes with a valuable appendix, contributed by Dr. J. Nevins Hyde, Chairman of the Statistical Committee of the American

Dermatological Association, consisting of a tabulated report, compiled by Dr. W. F. Robinson, giving the combined returns of cases observed by the individual members of the Association from June 30, 1878, to January 1, 1893, the sum total of cases recorded being 204,866. The importance and value of this work for American dermatology cannot be over-estimated, and the information is a useful addition to the volume.

A few words must be said in praise of the illustrations, comprising chromo-lithographs, photographs, and woodcuts, most of which are original. Some of the photographs, notably those illustrating certain forms of lichen ruber (from the camera of Dr. G. H. Fox, well known for his great success in photographing cutaneous diseases), are admirable, and show the value of photography for depicting lesions of the skin. We much prefer work of this kind to some of the chromo-lithographs copied from foreign works contained in the volume, as being in every way more accurate and instructive. Several chromo-lithographs of cases furnished by A. R. Robinson (as hidrocystoma, lupus vulgaris, and dermatitis exfoliativa) are notable exceptions, being in keeping with the other many excellent features of the book.

After a careful perusal of the subject-matter of the whole volume, we have no hesitation in saying that the editor and the contributors are to be heartily congratulated upon the completion of their labors in so successful a manner. As a whole, it is a memorable and monumental work, reflecting great credit upon American dermatology. It is, of course, a book of reference rather than a concise treatise, and the criticism that, viewed in its entirety, some of the writing is diffuse in style, does not detract in any degree from the intrinsic value of the information it contains. It must long remain a standard and valuable work. L. A. D.

THE PRINCIPLES OF SURGERY AND SURGICAL PATHOLOGY. GENERAL RULES GOVERNING OPERATIONS AND THE APPLICATION OF DRESSINGS. By HERMAN TILLMANNS, Professor in the University of Leipzig. Translated from the third German edition by JOHN ROGERS, M.D., New York, and BENJAMIN TILTON, M.D., New York. Edited by LEWIS A. STIMSON, M.D., Professor of Surgery in the University of the City of New York, Medical Department. 8vo., pp. 800, with 441 illustrations. New York: D. Appleton & Co., 1894.

IN this translation of Tillmanns' work upon the principles of the surgical art and science we have a wide departure from the English and American type of surgical text-book. Excepting Senn's *Principles of Surgery*—a very much less complete and valuable book—we are aware of no surgery upon the modern scientific German plan that has been published in English. Yet all impartial observers must believe that the marvellous disclosures of pathology and bacteriology will compel a more and more rigid separation of the principles of surgery from the application of these generalizations to special and varying local manifestations. In Tillmanns' work we find the modern classifications and teachings of the fundamentals carried out with admirable clearness, terseness, and completeness. While nothing is included which might be omitted excepting to the detriment of the student or practitioner, the volume nearly or quite equals in size most English text-books embracing both subjects. It is encyclopedic to a degree almost unknown within equal space.

While according to this work one of the highest places in the literature, it will be gratifying to the American surgeon to observe from its perusal the fact that in this country surgical pathology is no longer lagging so far behind our admitted lead in the practical application of the art. We find in it little that has not been laboriously added to the knowledge of the leaders of American surgery from many and varied sources, but which now has been assembled and arranged by a master mind, and, by equally masterful translation, rendered accessible in the mother tongue to all of the English-speaking race.

Extended comment is here impossible and needless. The volume as a whole is entitled to and will receive highest praise from every standpoint. Its adoption as a text-book will surely prove alike beneficial to teachers and students and serve as a worthy model upon which future American text and reference books may with advantage be based.

The translators and editors are to be warmly congratulated upon the uniform excellence and acceptability of their work. The illustrations are profuse and, generally, of high merit, especially the photo-micrographs and plates of bacteria and diseased tissues, while the mechanical and typographical features are in every way worthy of the publishing-house from which it is issued.

The volume is divided into three sections, the first of which deals with the general principles governing surgical operations, such as preparation for aseptic operations, the alleviation of pain during such procedures, prevention and arrest of hemorrhage, methods of dividing and reuniting tissues, drainage, after-treatment, amputations, resections, and repair of defects.

Section two relates to the methods of applying surgical dressings, as well as their preparation, the sick bed, immobilization apparatus, etc.

The third and most important division portrays, in a manner unknown in English surgeries, bacterial and bacterial wound diseases, infectious surgical processes, the chronic mycoses, as tuberculosis, syphilis, leprosy, and actinomycosis; injuries and diseases of bones and joints, gunshot wounds, military practice, and, finally, a chapter on tumors.

T. S. K. M.

ON CHOREA AND CHOREIFORM AFFECTIONS. By WILLIAM OSLER, M.D., Professor of Medicine, Johns Hopkins University. Pp. 121. Philadelphia: P. Blakiston, Son & Co., 1894.

WRITTEN in the usual pleasant style of the author, with the judicious mixture of the observations of others, with the results of his own large experience, this work will be one more classic for which the profession is indebted to Dr. Osler. From beginning to end the book is deeply interesting, and is exceedingly free from unnecessary technicalities, and from the needlessly complicated nosological classification so much affected by writers upon matters neurological at the present time.

The classification of the various affections more or less closely allied to chorea is a subject that deserves, and at the author's hands receives, careful consideration. Dr. Osler has wisely omitted all study of chorea major and the so-called symptomatic choreas with the exception of the chronic progressive form. To have included these would have been to introduce into the volume questions entirely remote from chorea minor and what the author terms "choreiform affections," and would have marred the orderly arrangement and well-defined classification adopted in the volume before us.

An interesting brief review of the history of the literature of chorea introduces the subject of chorea minor. The portion of the book devoted to chorea proper is chiefly based upon the careful analytical study of 554 cases observed at the Philadelphia Infirmary for Diseases of the Nervous System.

The seasonal relations of chorea receive careful consideration, the author giving with his indorsement the views expressed in the paper upon that subject by Morris Lewis. Attention is drawn to the marked absence of imitation as an etiological factor among the cases upon which the author's conclusions are based.

The chapters dealing with the symptomatology of chorea are among the best, each symptom or group of symptoms being carefully studied. The subjects of chorea in the pregnant, in the adult, and in the aged, are treated of. Chapter IV. is occupied by a consideration of the cardiac signs and conditions encountered in chorea minor. In the 659 cases that form the basis of the monograph, 32.1 per cent. had heart murmurs during the attack. The author considers that the murmurs heard at the base or along the upper left margin of the sternum are functional in a large proportion of cases, and that they are probably accompaniments of the debility and anæmia. In regard to organic murmurs he speaks with authority, inasmuch as he has not only carefully studied the heart condition during the attack, but has examined 140 cases at an interval varying from two years to sixteen years after the appearance of chorea. Of this number, 72 presented signs of organic disease persisting after the subsidence of the attack.

The morbid anatomy of the disorder is so indefinite that but few positive statements are made save in regard to the well-known frequency of endocarditis in the fatal cases. In the section upon pathology the author first deals with the features of chorea that tend to bear out the theory of its infectious origin—its seasonal relations, its varying gravity, its frequent association with endocarditis. A consideration of the infective nature of acute rheumatism naturally follows. The conclusion at which Dr. Osler arrives is that "very probably the cause of chorea will be found to be a poison allied to, but not the same as, that of rheumatism."

In the matter of treatment nothing new is suggested. Avoidance of brain- or eye-strain at school, hygienic regulations, and maintenance of nutrition, with the combating of anæmia by iron and arsenic, are the measures recommended in the case of those who have once suffered. Rest and seclusion are urged in the treatment of the attack. Arsenic is the one drug that is recommended, but the specific action of this remedy is disposed of in the following sentences: "The general condition of the children is often much improved by this drug, but it is extremely difficult to say whether it controls in any way the choreic movements. I do not myself think that it has much influence upon them." Cotton-wool about the joints in arthritis, an ice-bag to the præcordia in cases with endo- or pericarditis, hydrotherapy with chloral and bromides for chorea insaniens, and the induction of premature labor in severe cases occurring during pregnancy, are the other measures recommended.

The portion of the volume devoted to "choreiform affections" is of great interest. The division adopted is: (1) simple tic, (2) tic with imperative ideas, etc., (3) complex, co-ordinated forms of tic, (4) cases of noisy spasm of the respiratory muscles. The introduction of numerous personally observed cases typifying the different varieties adds much to the value of the description of them.

In the last chapter chronic progressive chorea is dealt with. The history of the literature of the affection is first given, and a valuable bibliography is introduced. In the section upon its symptomatology the author relates the history of two families so afflicted that have come under his own observation, with the records of the autopsy performed by himself upon one of the cases. The name "chronic progressive chorea" rather than "hereditary chorea" is preferred from the fact that isolated cases of precisely similar nature have occurred in families free from other examples of the disease. The results of autopsies made up to date are given, but nothing very definite is asserted as to the significance of the lesions found or as to the pathogenesis of the disease.

An appendix is furnished giving an analysis of 73 fatal cases of chorea minor. Of these, 65 presented either recent endocarditis or the lesions of a former inflammation of the endocardium. Of the eight cases in which the endocardium was reported as normal, two had pericarditis; while in several of those in which endocarditis was present there were associated lesions of other membranes or organs.

The work is one that will be read with interest and profit by both neurologist and general practitioner. F. A. P.

PRACTICAL LECTURES IN DERMATOLOGY. By CONDICT W. CUTLER, M.S., M.D., Professor of Dermatology, University of Vermont; Physician-in-chief and Dermatologist to the New York Dispensary, etc. Pp. 233. New York: G. P. Putnam's Sons, 1894.

THE author having been requested by the students in the Medical Department of the University of Vermont to publish his Lectures on Diseases of the Skin, delivered to them during 1892–93, offers this as his excuse for the creation of another work on dermatology. The lectures were prepared from stenographic notes, the author states in the preface, and represent with substantial accuracy the lectures as they were delivered to the students.

They are practical, and are written in a somewhat colloquial style; only the commoner diseases of the skin are discussed, those which every physician should be able to diagnose and treat. From this introduction the general scope of the work will be apparent. The views expressed are in the main in accordance with those of the prominent teachers in this country. We are of the opinion that the book will prove of more interest to the student than to the practitioner. The concluding chapter comprises Dr. G. I. Jackson's "Dermatological Dont's," which have been published elsewhere. L. A. D.

PROGRESS
OF
MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF
REYNOLD W. WILCOX, A.M., M.D., LL.D.,
PROFESSOR OF CLINICAL MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; VISITING PHYSICIAN TO ST. MARK'S HOSPITAL.

The Treatment of Syphilis.

Dr. Vallert makes use of a 1 per cent. solution of mercury succinimide and cocaine muriate in distilled water. The amount of the drug contained in each injection is one-sixth of a grain. It is claimed that this form of mercury is generally well borne, with the addition of cocaine is not painful, and extended use has shown its superiority over other preparations of mercury when used hypodermatically.—*Therapeutische Monatshefte*, 1894, Heft 11, S. 542.

Dr. Ch. Mauriac does not believe that the iodide is an indispensable complement to mercurial medication, but that it is acceptable in case the patient shows a tendency to tertiary manifestation; still it is far from being an axiom. It is necessary to avoid establishing a tolerance, consequently it should not be continuously administered, but for periods of from four to five weeks, with intervals of rest of varying duration. The iodides should be given sometimes in early syphilis when it is ulcerative, and at the commencement of the secondary manifestations when there is an explosion of several accidents. In precocious tertiary accidents it is the remedy of excellence, and should be given in large doses. The duration of the treatment of syphilis in the majority of cases should be three years. For mercurials sublimate and the yellow iodide given alternately are preferred.—*Journal des Practiciens*, 1894, 2d Semestre, No. 36, p. 436.

Experimental Researches in Anæsthesia.

M. L. Guinard shows from experiments upon dogs and guinea-pigs that it is dangerous to place under general anæsthesia subjects who have grave visceral lesions, who are markedly depressed, and more or less in a state of collapse. In anæsthetized patients every irritation of the intestine can be dangerous, and may reflexly cause arrest of the respiration. In grave abdominal lesions anæsthesia is dangerous, no matter what agent is employed, but the progress of fatal accidents is more rapid with chloroform than with ether.—*Bulletin Général de la Thérapeutique*, 1894, 42d liv., p. 402.

THE ACTION OF TRIONAL.

M. VOGT concludes: 1. That trional is preferable to its congener, sulphonal, in that it acts more promptly and produces a calm sleep with a normal awakening. 2. The dose is a single one, taken at bedtime, of fifteen to twenty-two grains dissolved in liquid as hot as possible. If the drug, taken two evenings in succession, does not produce a slight effect, it is useless to continue it. 3. The treatment should be stopped in every case at the end of five or six days. If this is done, there is no fear of poisoning, and generally during this time the patient is relieved of his insomnia. 4. It is always a good plan to diminish the acidity of the urine in order to avoid grave accidents from the destruction of the blood-corpuscles, and this is done by the administration of alkalies. 5. The constipation which frequently follows the administration of this remedy should not be neglected, in order to avoid accumulation through lack of elimination.—*Les Nouveaux Remèdes*, 1894, No. 21, p. 489.

DR. C. GOLDMAN in order to prevent unpleasant symptoms presents the following rules: 1. It should never be administered in larger doses than thirty grains; generally twenty-two grains will produce a sleep of from six to eight hours; neurasthenic individuals usually need but fifteen grains. 2. It should never be administered dry or in a little cold water, but in a cup, of six or seven ounces capacity, of a warm liquid, soup or tea. This facilitates prompt absorption and rapid action. 3. The use of the drug should from time to time be interrupted—no hypnotic should be uninterruptedly administered for weeks or months. 4. In order to prevent an accumulation of the unabsorbed drug it is necessary to increase the alkalinity of the blood by mineral waters containing carbon dioxide, as seltzers, apollinaris, or the organic acids, as citric or tartaric. 5. If, in spite of this precaution, constipation becomes marked, seidlitz powder or a similar laxative should be employed.—*Therapeutische Monatshefte*, 1894, Heft 11, S. 559.

THE TOXICOLOGY OF EXALGINE.

DR. GEORGE WEBER reports the case of a young woman who survived the ingestion of one-half ounce of crystalline exalgine. Three-quarters of an hour elapsed before the first effects were produced; ten hours later occurred the first vomiting. Periods of coma alternated with convulsive crises, resembling the symptoms of mixed uræmia, which resemblance gave the indications for treatment. The cyanosis was successfully treated by electrization of the phrenic.—*Les Nouveaux Remèdes*, 1894, No. 22, p. 514.

THE USE OF ANTIPYRIN IN LARGE DOSES.

DR. T. MCCALL ANDERSON has never had any personal experience with the deleterious effects, at least of a serious nature, of this drug. The initial dose should not exceed ten, or at most fifteen, grains. In the three cases reported the maximum daily amounts were seventy-five, one hundred and fifty, and one hundred and thirty-five grains. He concludes: 1. That antipyrin is not the dangerous drug that some observers have led us to suppose. 2. It may be given with safety in large doses, even in the case of children, in most cases, although the initial dose must be small, and it must be slowly and cautiously increased, the patient always being carefully supervised. 3. In large doses it often yields surprisingly good results, and in chorea it is the only medicine from which cures may confidently be anticipated.—*British Medical Journal*, 1894, No. 1770, p. 1227.

THIOL.

DR. DILLON states that this drug differs from ichthyol in that it has no disagreeable odor; the internal administration is not accompanied by disagreeable gastric disturbance; used externally it does not more than slightly stain the clothing, and even this can be removed by washing. It seems to be especially curative in the different forms of eczema, acne, herpes, erysipelas, and other inflammatory processes. In contusions and subcutaneous hemorrhages it possesses wonderful power of causing the absorption of the poured-out material. It has also been found useful in rheumatism.—*Notes on New Remedies*, 1894, No. 2, p. 21.

URICEDIN.

DR. HUGO LANGSTEIN concludes that this remedy: 1. In the form of cakes is not unsavory even to somewhat delicate palates. 2. Even in daily doses of one hundred and fifty grains it has no unpleasant after-results. It may, however, act as a purgative, which in cases of uric acid diathesis is not disadvantageous, but it is not unpleasant nor painful in its action. 3. Contrary to that, which cannot be said of all remedies for gout, it does not irritate the kidneys nor the heart, even after long usage. 4. It markedly increases the diuresis. 5. It is somewhat more certain, although not always more rapid, than other remedies for the elimination of uric acid. At first there is an increase of uric acid in the urine, soon it becomes less acid, neutral, or even alkaline. 6. The remedy combats and limits pain.—*Prager medicinische Wochenschrift*, 1894, No. 45, S. 571.

[For a previous notice of this drug, in which its composition is given, see this JOURNAL, 1894, vol. cvii., No. 6, p. 714.—R. W. W.]

HOW TO USE SODIUM SALICYLATE IN ACUTE ARTICULAR RHEUMATISM.

DR. HENRI HUCHARD believes that three principles should never be forgotten: 1. No prescription in large doses at the commencement of a polyarticular rheumatism. 2. The division of the doses. 3. The continuation of the remedy after the relief of pain. At the outset the dose should be ninety, sometimes even one hundred and twenty grains. The average dose of ninety grains should be maintained for about two days, then diminishing fifteen grains each day until sixty grains is reached. These large doses are necessary because the drug is useful the more acute and recent the disease is, and because early treatment certainly prevents cardiac complications. Divided doses are advisable because of the rapid elimination of the drug;

in this way only can the effect be made more lasting and complete. For this purpose direct fifteen grains to be taken every two or three hours. Further, it should be prescribed for at least twelve days after the pain has been relieved. It may be administered in solution or in fifteen-grain wafers, which should be dissolved in a definite quantity of liquid—an alkaline water, or a half glass of Vichy (Célestins). Because the drug is a local irritant it should never be administered in a concentrated solution. In case of pregnancy it should be administered cautiously in divided doses. The albuminuria of rheumatic origin is not a contra-indication to the use of this drug, but when it precedes the rheumatism, and especially when it is due to a renal lesion which impairs the permeability of the kidneys, it is contraindicated, but the dangers of its use have been exaggerated.—*Journal des Practiciens*, 1894; 2d Semestre, 1894, No. 41, p. 513.

THE TREATMENT OF DIPHTHERIA.

DR. B. VAND. HEDGES presents what he terms the rational treatment: (1) Thorough disinfection with hydrogen peroxide solution, rendered neutral with sodium bicarbonate. (2) Administration of freshly prepared pineapple juice, either alone or with the tincture of ferric chloride if a condition of anæmia exists. (3) Application of papoid, either by insufflation of powder or painting with strong solution. (4) Alcohol given in heroic doses. (5) Strychnine administered hypodermatically and pushed until there is an exaggeration of the deep reflexes. (6) Concentrated nutritious diet.—*New York Medical Record*, 1894, vol. xlvi. p. 682.

DIPHTHERIA ANTITOXIN.

DRS. J. W. WASHBOURN, E. W. GOODALL, and MR. A. H. CARD report a series of eighty cases. Of these, eight were excluded because they were not clinically, as well as bacteriologically, cases of diphtheria. Of the seventy-two cases, only sixty-one showed diphtheria bacilli, and of these thirteen died. There were nine cases upon which tracheotomy was performed, with six recoveries. Twenty of these sixty-one cases were, upon admission, suffering from the toxic effects of diphtheria, and an unfavorable prognosis was made; eight of these cases recovered. There is no evidence that the antitoxin diminishes the incidence of albuminuria. It is still too early to speak of the effect in the incidence of paralysis, but so far six cases have occurred. A rash occurred in twenty-four per cent. of the cases in from seven to nineteen days after the injection. In six cases there were joint pains which appeared about the same time as the rash, and lasted, at the most, three days, the hip being more frequently attacked. The dose is to be regulated, not by the age or weight of the patient, but by the severity of the attack.—*British Medical Journal*, 1894, No. 1773, p. 1417.

DR. OTTO TREYMANN reports a case of acute hemorrhagic nephritis after the use of Behring's antitoxin. The patient, a boy of three years, upon the third day of his diphtheria received the antitoxin. This treatment was repeated upon the two days following, omitted for six days, then a single injection. Upon the following day there was noticed an eruption, bad general condition, and albumin in the urine. The next day the urine was scanty, of hemorrhagic color, coagulating on heating. Microscopical examination showed numerous red and white blood-corpuscles, a few casts, and epithelial cells. Esbach's albuminometer showed that it contained 4 per cent. of albumin. Six days after, the albumin disappeared and convalescence was established.—*Deutsche medicinische Wochenschrift*, 1894, No. 51, S. 951.

BLOOD-SERUM THERAPY.

DR. GEORGE E. KRIEGER in a seventy-page book gives an interesting *résumé* of this subject, including the antitoxins. Taking as the text the fact established by Behring, that the blood and blood-serum of an individual which has been artificially rendered immune against a certain infectious disease may be transferred to another individual with the effect to render the latter also immune, no matter how susceptible this animal is to the disease in question, he adds the statement of Behring and Kitsato, that the immunity of rabbits and mice, when rendered immune against tetanus, is based upon the ability of the blood-serum to neutralize the toxins produced by the tetanus bacilli. Tetanus is next considered; a brief summary of the cases in which the tetanus antitoxin of Tizzoni and Cattani has been used; most of these cases are already familiar to the readers of this JOURNAL (Department of Progress). The rules for the use of this antitoxin are as follows: 1. Since the reaction is usually proportional to the quantity of poison introduced into the organism, an early and thorough antisepsis should be observed in dressing the original wound. 2. The best means for the efficacious neutralization of tetanus germs and toxins have been found to be a strong solution of sublimate with tartaric acid, and especially the cautery. 3. The amputation of the infected part, even if the latter is of minor importance, will hardly afford any benefit, because the soluble poison is rapidly absorbed and carried into the circulation. 4. As soon as the place of infection has healed, no beneficial results can be expected from local treatment, and no time should be lost in using the antitoxin in doses to effect the best possible immunity. 5. The quantity of antitoxin to be injected is determined according to the strength of the latter, the gravity of the infection, provided there are visible symptoms, the time since the infection has occurred, and the age of the patient. The shorter the time of incubation or the more serious the latter, the larger ought to be the first dose of antitoxin. 6. The number of injections necessary to save the patient depends also on such circumstances as are just mentioned; but, as a rule, one injection should be administered every other day with a somewhat smaller quantity than was used at first, in order to maintain a sufficient immunity and so prevent a relapse, which occasionally occurs, even after the immunity has set in, and which is due to a premature elimination of the antitoxin. For diphtheria it can be said (1) every case should be treated in its incipiency locally with such antiseptics as seem fit to suppress a mixed infection. (2) The antitoxin will be of so much better effect, even in cases of mixed infection, the sooner a proper dose of antitoxin is administered. (3) The seriousness of a diphtheria infection is frequently underestimated, and for this reason it seems advisable to apply rather large than insufficient doses; for light cases two to three hundred immunizing units, for severer ones, especially after tracheotomy, five to eight hundred units. (4) The application of the serum has to be repeated according to the gravity of the case, on the next day, or even on the same day, until a quantity of six to ten hundred or more units has been injected. (5) The administration of a serum of high potency is preferable to the corresponding amount of a weaker preparation. Used as a prophylactic, an average of one to two hundred immunizing units is sufficient to protect a healthy child against infection. As the immunity gradually decreases according to the elimination of the antitoxin, if no additional injections are given, it is evident that its duration also depends upon the quantity first administered. On the other hand, one can maintain an immunity for a longer period by repeated application of smaller doses at certain interavls.

THE ACTION OF SODIUM BICARBONATE ON THE GASTRIC FLUIDS.

MM. G. **LINOSSIER** and G. H. **LEMOINE** have made a clinical study of this much-discussed subject, and formulate the following conclusions:

1. The excitation following the administration of this drug is the result of its immediate action upon the gastric fluids; the consecutive depression is connected with the general action of the drug, namely, the alkalinization of the blood.

2. In practice, for obtaining and keeping within the excitant action of the drug, it is necessary to employ moderate doses given before the meal, and continue the treatment for short periods. For the sedative action large doses during or after the meal, and for considerable periods of time, are necessary.

3. Whether a dose is large or small depends entirely upon the condition of the gastric secretion. The sensibility of the stomach to this drug is inversely as the contained hydrochloric acid.

4. The above conclusions apply also to Vichy water and probably to the other waters containing sodium bicarbonate.—*Bulletin Général de la Thérapeutique*, 1894, 46e liv., p. 492.

CERTAIN PROCESSES OF BRINGING ON MENTAL QUIETUDE.

MR. H. C. **SEN** believes that there is a physiological alternate erectility of the mucous membrane covering the posterior parts of the middle and inferior turbinate bones, lasting for about an hour and a half to three hours; this being independent of any nasal disease. When the mind is free from any anxiety, and occasionally after a hearty dinner, or after a refreshing bath, both of the nasal mucous membranes become simultaneously free from any erectility, this freedom being always of short duration and concomitant with a peculiarly peaceful state of mind. Those persons who are able to insert their tongue-tip into their own naso-pharynx, find that they enjoy a peculiar pleasurable sensation, and that their power of concentration of mind remains stronger. From both of these causes the current of tidal air becomes feebler without producing any discomfort. As the current of tidal air becomes feeble the mind shows a tendency to quietude and steadiness. To prevent the mind from becoming unsteady, concentration of the mind to the different regions of the spinal column is often advised, traversing the whole length in an upward and downward direction with inspiration and respiration alternately. These processes for producing concentration of the mind are called by the Hindus *yogakarma*, and if practised under the direction of an expert *yogi-gurn* are marvellously beneficial.—*MS. Report*, 1894.

PAPAIN.

DR. A. HIRSCH reviews the literature of this remedy and has made a very careful laboratory study. The especial method of administration is that it shall be suspended in the smallest possible quantity of water, given immediately after the meal, and repeated two or three times at from fifteen to thirty minutes, and in doses which are not too small—four, five, or seven grains. In addition careful regulation of the diet is by no means to be neglected if success is to follow the administration of the drug.—*Therapeutische Monatshefte*, 1894, Heft 2, S. 609.

OREXIN HYDROCHLORIDE.

DR. FERDINAND BATTISTINI has carried out a series of experiments to determine the value of this drug. Severe toxic symptoms have not been noted; in cases where the remedy has been used for more than six weeks there is a lessening of the hæmoglobin. In artificial digestion it apparently has no effect upon peptonization. As regards the appetite—of twenty-five cases it failed in six, a slight increase in thirteen, and a marked improvement in six. The results are apparently not very encouraging for the remedy, although some failures may have arisen from the use of the remedy in pill-form.—*Therapeutische Monatshefte*, 1894, Heft 12, S. 614.

RHUS TOXICODENDRON.

DR. H. M. WHELPLEY, recognizing toxicodendric acid as the active medicinal and poisonous principle of the plant, has ascertained that handling of the dried and compressed plant will produce the well-known eruption, although its poisonous action may be impaired by drying. The drug has been recommended as useful in a large number of morbid conditions, from nocturnal incontinence of urine to pemphigus. Among the antidotes to its poisonous action may be cited: solution of chlorinated lime, cold lead-water, sodium hyposulphite, saturated tincture of lobelia, hamamelis, bismuth subnitrate, phenol, linseed oil, strong coffee, and potassium permanganate.—*Bulletin of Pharmacy*, 1894, No. 12, p. 552.

ETHYL BROMIDE.

DR. CHARLES GREENE CUMSTON states that this drug is fit for administration only when it is (1) extremely volatile, (2) colorless, (3) and of a sweet and ethereal odor. The dose varies from three drachms (child of two years) to six drachms (adult). Food, even a glass of milk, is absolutely forbidden upon the day of operation. The mask should perfectly cover the mouth and nose, so that no air is allowed to enter. The entire dose should be given at once. Sleep is obtained in twenty to thirty seconds, and lasts from two to three minutes, sometimes longer. When narcosis is complete the mask should be removed, and under no consideration reapplied. After an experience of two hundred cases the following rules are given: (1) Ethyl bromide should be carefully distinguished from ethylene bromide. (2) A pure and, if possible, a freshly prepared drug should be used. (3) Administer the drug *en masse*, since some patients have died from small and continued doses. (4) Do not prolong the administration over one minute. (5) When once the mask is removed and the operation begun, do not apply it again. (6) The contraindications are dangerous lesion of the heart, lungs, and kidneys.—*Boston Medical and Surgical Journal*, 1894, vol. cxxxi. p. 613.

MEDICINE.

UNDER THE CHARGE OF

GEORGE DOCK, M.D.,
PROFESSOR OF MEDICINE IN THE UNIVERSITY OF MICHIGAN;

AND

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ADJUNCT PROFESSOR OF CLINICAL MEDICINE IN THE PHILADELPHIA POLYCLINIC.

Pancreatic Hemorrhage, Pancreatic Necrosis, and Fat-Necrosis.

Caspersohn (*Centralblatt für Chirurgie*, 1894, No. 47, p. 1163) has reported the case of a corpulent woman, thirty-six years old, who was seized with vomiting and intense pain in the epigastrium. After rest in bed for two weeks and suitable internal medication, improvement set in and continued for ten or eleven weeks. At the end of this time both the vomiting and the pain were renewed. There was marked elevation of temperature, slight distention of the abdomen, with general tenderness, particularly in the epigastrium. The urine was diminished in amount, but contained no albumin. In the course of a week the vomiting and the tenderness subsided, and the amount of urine returned to normal. The improvement continued for twelve days, when the previous symptoms returned. A sense of resistance was now easily distinguished in the left hypochondrium. The condition of the patient became so alarming that exploratory cœliotomy was undertaken. A vertical incision was made in the mammillary line over the seat of resistance, and after division of a heavy layer of fat a tumor-like mass resembling a neoplasm adherent to the peritoneum was exposed. This proved to be degenerated and cicatrized fatty tissue. In places small fragments of coagulated blood were visible. Upon extending the abdominal incision a considerable quantity of brownish fluid escaped. An incision into the mass within the abdomen failed to disclose a focus of inflammation, The pulse had by this time become so poor that the operation had to be prematurely terminated. The wound was partially sutured and partially tamponed with iodoform-gauze. The patient failed to react, and death ensued from heart-failure. Upon post-mortem examination cicatrized and adherent masses of fat were found everywhere in the mesenteric structures. Behind the liver and adherent to its inferior surface was a large cyst containing clear, odorless fluid of dark, coffee-brown color. The liver, stomach, and adjacent parts were removed, and further examination showed total necrosis and partial sequestration of the pancreas and remains of hemorrhage into the pancreas; sacculated chronic peritonitis of the gastro-hepatic omentum, together with an exudate containing hematin; and increase and disseminated necrosis of the fatty tissue.

ULNAR PARALYSIS FOLLOWING TYPHOID FEVER.

WOLF (*Wiener medicinische Presse*, 1894, Nos. 46 and 47) has reported the case of a boy, ten years old, who, several months after recovery from a severe attack of typhoid fever, attended with slight intestinal hemorrhage, was noticed to use his right hand awkwardly, and avoid its use when possible. The patient was quite unconscious of his peculiarity, and had suffered neither pain nor abnormal sensation in the right hand and forearm. On examination there were found palsy and atrophy in the distribution of the right ulnar nerve. The first phalanges of the fourth and fifth fingers were in a position of extension, while the second and third phalanges of the same fingers were flexed. The function of the interossei was in abeyance, and the patient was unable to separate or approximate the fingers. The muscles of the hypothenar eminence and of the first interosseous space were flabby and wasted, and the abductor pollicis brevis was notably atrophied. The thumb was abducted. The electric irritability of the ulnar nerve was quantitatively diminished to both forms of current. The muscles yielded the reaction of regeneration. Sensibility appeared slightly diminished to the faradic current.

ON THE VALUE OF THE COMMONEST TESTS FOR GLUCOSE IN URINE.

A. JOLLES (*Centralblatt für innere Medicine*, 1894, Nos. 44 and 45) gives an exhaustive report on the results of a large series of experiments with different tests for sugar in urine. For details regarding various tests the original must be consulted. Among the author's conclusions the following are noteworthy: Glucose is not a constituent of normal urine, and can only be found there when large quantities are used, and then only in traces. For the recognition of the proportion of sugar in urine it is necessary to use a sample taken from the excretion of twenty-four hours. The specific gravity of normal urine is higher than hitherto supposed, *i. e.*, 1018 to 1022. The presence of sugar cannot be concluded from a high specific gravity. Small proportions of sugar do not influence specific gravity appreciably. Trommer's test and that of Worm-Müller indicate quantities of sugar as small as 0.08 per cent., but as much as 0.24 per cent. may be simulated by other substances. Next to uric acid and creatinin, the coloring-matters of urine and of bile are the most important reducing agents which simulate the sugar test. Diabetic urines which have stood for some time sometimes undergo decomposition of urea, with the production of ammonia in amounts which impair the accuracy of the reduction tests. Nylander's test, which is accurate for quantities of more than 0.3 per cent. of sugar, can only be applied in non-albuminous urine. Albumin if present must be coagulated by boiling, and not precipitated, as in the latter case some of the sugar is carried down. In using the polariscope it must be remembered that not only certain urinary salts, but also some drugs excreted by the kidneys (*e. g.*, benzosol) may impair the result. In using the fermentation test the yeast must be free from starch; the temperature need not be elevated. The sensibility of this test is about 0.1 per cent. The phenylhydracin test is one of the most certain. The crystals of glycuronic acid, which occur frequently, can be distinguished under the microscope from those of phenylglucosazon by their relative shortness and thickness and their tendency to form rosettes rather than clusters. The sensibility of the test is about 0.03 per cent.; less in urine containing large amounts of urates or albumin, and in concentrated urine. The test-tube containing the urine and reagents should be boiled in a water bath for one hour, and then allowed to cool slowly and for a long time (twelve to fourteen hours).

PERI-ARTICULAR ABSCESS DUE TO THE TYPHOID BACILLUS.

SWIEZYNSKY (*Centralblatt für Bacteriologie und Parasitenkunde*, Band xvi., No. 19, p. 775) has reported the case of a man, eighteen years old, with the following sequence of an attack of typhoid fever of considerable severity: swelling and pain appeared in the right arm, followed by redness, tenderness, and fluctuation about the shoulder-joint, although this itself was not involved. In the course of a little while an abscess formed beneath the right deltoid, and an incision evacuated a quantity of pus mixed with blood. The wound healed without complication, but three days later symptoms of occlusion of the left femoral vein appeared; nevertheless, recovery eventually ensued. Bacterio, logic investigation of the pus evacuated from the abscess about the joint disclosed the presence of typhoid bacilli exclusively.

THE RELATION OF THE PANCREAS TO DIABETES.

HANSEMANN (*Zeitschrift für innere Medicin*, Bd. xxvi. Heft 3 u. 4) has made a valuable statistical investigation on this subject, which has shown itself so difficult of solution. The remarkable investigations of Minkowski and von Mering in the production of diabetes by extirpation of the pancreas in dogs did little to clear up the discordant results of examinations of cases of diabetes in man, and the fact that in some animals removal of the pancreas is not followed by diabetes left the matter in much the same position it occupied before. Yet of the relations in dogs there could be no doubt, so that an examination of a large number of cases like those accessible to Hansemann could hardly fail to be profitable.

To functions like that which, on the part of the dog's pancreas, control diabetes, Hansemann had previously applied the term "positive," as contrasted with "negative" functions like that of the kidneys in the secretion of urine, of the liver in the secretion of bile, etc. This term seems preferable to "internal secretion," which we have taken from the French.

In analyzing his material Hansemann made three groups of cases: 1. Diabetes without alteration of the pancreas; 2. Pancreatic disease without diabetes; 3. Pancreatic disease with diabetes.

As regards the first group, the author found cases, as had others, of diabetes in which the most minute examination failed to show alterations in the pancreas.

In regard to the second group, one must remember that, according to Minkowski, the severity of experimental diabetes in cases of partial removal of the pancreas bears no relation to the amount of the gland remaining, nor to the intensity of the evident anatomical change in that part. From this it can be understood that most cases of cancer of the pancreas and of cysts do not come under consideration. Cloudy swelling and fatty degeneration are not supposed to lead to diabetes because of the slight loss of function these changes involve. Cases of acute necrosis of the pancreas might be supposed to lead to diabetes. But out of one hundred cases collected by Fitz and Seitz only two had diabetes. Another case was observed by Frerichs. In most of these cases, however, the course of the disease was so short that it may easily be supposed there was no time for the development of diabetes (which does not occur at once after extirpation in dogs). In the cases of longer duration it may be doubted whether the whole gland was destroyed. Another disease which might be supposed to lead readily to diabetes is diffuse cancer of the pancreas. Two such cases were observed by Hansemann without diabetes. This the author explains by the ingenious supposition that the cells of the new growth continue the positive function of the cells from which they are derived.

Calculus with atrophy has been observed in combination with diabetes in some cases, but in others diabetes was not present. The author reports two more cases of this kind, without diabetes. In these cases, however, the glands were partly unaffected.

From the records of the Berlin Pathological Institute and the Augusta Hospital Hansemann was able to discover that the cases with the coincidence of disease of the pancreas and diabetes occurred more frequently than diabetes alone, or pancreatic disease alone, and in fact oftener than these two combined.

The commonest disease of the pancreas found in diabetes, according to the author, is an atrophy which differs both to the naked eye and microscopically from atrophy as the result of diabetes or of cachexias. Hansemann compares it with certain forms of contracted kidney. It earliest anatomical signs are similar to those described by Lepine as periacinose sclerosis. This atrophy rarely leads to complete destruction of the pancreas. The process is not identical with fibroid induration of the pancreas, which results from acquired and congenital syphilis, and which is sometimes observed in diabetics.

As the result of his examination Hansemann formulates the following conclusions: There is nothing known which opposes the application of the results of experiments in canine pancreatic diabetes to man. The total destruction of the pancreas in man may be assumed to cause diabetes. If the pancreas is partly destroyed, diabetes may not appear. The destruction of the pancreas does not produce any special form of diabetes, nor has it any relation with age or sex. The alterations in the pancreas in diabetes are very manifold. Acute inflammation, necrosis, occlusion of the duct, atrophy from pressure, cysts, and spontaneous atrophy occur with or without diabetes. The only exception to this is the genuine atrophy (or the granular atrophy of Hansemann). This belongs to the chronic interstitial inflammations, and seems to lead essentially to a lessening of the positive function of the pancreas. The precise histological change which is connected with this diminution of function Hansemann does not attempt to state. Nothing can be recognized but a diminution in size, and at times slight fatty degeneration of the parenchyma cells. Just as the genuine contracted kidney gives characteristic symptoms, so the granular atrophy of the pancreas leads necessarily to diabetes, whereas the other diseases only cause diabetes when sufficiently extensive.

Hansemann, in the same article, describes briefly but clearly a condition of the kidneys characteristic of diabetes. The organs are enlarged, the surface smooth. The cortex is pale red, sometimes yellowish. The glomeruli are plainly visible as red points. The medulla is somewhat cyanotic. Microscopically, the tubules of the cortex show cloudy swelling, at times an extensive and uniform fatty degeneration of the epithelium of all parts of the tubules. This may be found in cases presenting only slight albuminuria during life. The nuclei stain well. The bloodvessels, especially the glomeruli, are distended. Interstitial proliferation is not present. The whole process appears as a consequence of the excessive excretion of a slightly irritating substance, an hypertrophy from overwork. This process, of course, does not exclude the possibility of other alterations.

The Importance of the Liver in Pancreatic Diabetes.

Marcuse (*Zeitschrift. für klin. Medicin,* Bd. 26, Heft 3 u. 4) has removed the liver immediately after extirpation of the pancreas, in frogs. Most of the animals lived more than two days, within which period the author found that glycosuria occurred after removal of the pancreas alone. In none of them did glycosuria follow. The explanation of this, Marcuse thinks, is not that the liver is the place of formation of the diabetic sugar, but that either a substance, so far unknown, appears which is normally used in the liver, and which paralyzes pancreas diabetes, or else that normally a sugar-forming substance is formed in the liver and distributed to the blood and tissues, which indirectly causes diabetes. As the author remarks, the observation is not of much value in itself, but it opens up a number of new points of view of great interest.

Levulose in Diabetes.

W. Hale White and R. Grube report (*Zeitschrift für innere Medicin,* Bd. 26, Heft 3 u. 4) two series of experiments, carried out independently, on the use of levulose in diabetes. White's eight cases (seven patients, one treated twice) were, with one exception, severe; the seven cases of Grube, with one exception, mild. Both observers reach similar conclusions to those of Leyden and Minkowski, that levulose can be taken by diabetics without bad results, and that in the bodies of such patients fruit sugar can be used even when cane sugar and glucose cause excessive excretion. The account of White's experiments is to be published in full in the fiftieth volume of *Guy's Hospital Reports.*

SUDDEN DEATH FROM RUPTURE OF THE STOMACH INTO THE LEFT THORACIC CAVITY.

CZERNICKI (*Archives de Médecine et de Pharmacie Militaires*, 1894, No. 11, p. 395) has reported the case of a man who came under observation on account of intense abdominal and thoracic pain, with vomiting and attacks of syncope. After a time the pain subsided and the vomiting ceased, but the patient continued to present an anxious appearance, and the pulse was frequent, compressible, and feeble. The heart was markedly displaced to the right, its impulse feeble, and its sounds faint. The left thoracic cavity presented anomalous areas of dulness and resonance on percussion, with abnormal auscultatory phenomena. The patient slept for a short time, and was observed subsequently to speak to his neighbor, but somewhat later he was found dead. Upon post-mortem examination the left pleural cavity was found occupied by the greatly distended stomach, which had gained entrance through a rent in the diaphragm and had compressed the left lung. The margins of the opening in the diaphragm appeared in process of cicatrization. The stomach presented a triangular perforation on the greater curvature, surrounded by an area of inflammation. From information subsequently gained, it is believed that the rupture of the diaphragm had taken place some time before the patient came under observation, in the course of wrestling with a comrade. There had been previous paroxysmal attacks of pain that were ascribed to intestinal colic.

MERCURIAL PSEUDOTABES.

GILBERT (*Deutsche medicinische Wochenschrift*, 1894, No. 44, p. 842) has reported the case of a man, twenty-six years old, who had been infected with syphilis and had been actively treated. He presented severe pains in the lower extremities, and subsequently complete palsy and muscular atrophy. There was reaction of degeneration and the tendor-reflexes were wanting, but there were no ataxic symptoms. The case was considered one of paralytic polyneuritis of syphilitic origin, aggravated by abuse of alcohol and tobacco. Treatment with mercurial inunctions, and subsequently, as the pain subsided, with massage and potassium iodide, was followed by notable improvement, so that the patient became able to walk about with the aid of sticks. Ataxia had now developed, and was augmented when the eyes were closed. Sensibility was impaired upon the lower extremities, below the upper third of the leg, and particularly upon the right side. The function of the bladder was deranged. The patient complained of burning pains following the course of the nerve-trunks of the upper and lower extremities. There were numbness in the feet, and a sense of weakness and uncertainty in walking. Improvement followed the use of a roborant, bland diet, with a course of baths, massage, and electricity. The patellar tendon-reflexes returned, and the patient had comparatively recovered; he, however, indulged in alcoholic excess, which was followed by anasarca, and led to a fatal termination. It is believed that the symptoms were largely due to multiple neuritis dependent upon mercurial intoxication.

SURGERY.

UNDER THE CHARGE OF

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THE SURGERY OF THE SPINAL CORD AND ITS APPENDAGES.

WILLIAM THORBURN reviewed the present position and future prospects of the surgery of the spinal cord and its appendages in two lectures recently delivered before the Royal College of Surgeons of England (*British Medical Journal*, 1894, Nos. 1747 and 1748). The term "laminectomy," it is pointed out, is of quite recent creation, but is adopted throughout as more suitable than the older terms, "trephining the spine," "vertebral resection," "rachiotomy," etc. "Lamnectomy" is preferable, but has not been genererally accepted. The author says, "The dangers of the operation are not great, especially in view of the conditions which it is intended to relieve."

Mortality. Of seventy cases of tuberculous affections for which laminectomy was performed by distinguished surgeons, in twelve instances death is said to have been due to or hastened by the operation—a mortality of 17.1 per cent. The death was in most cases attributed to shock. Sepsis has been practically absent, and hemorrhage has rarely been serious.

Penetrating wounds of the cord. Of forty published cases of stab-wounds, in thirty-eight of which the result is stated, but fifteen died—in nine instances from septic infection. In twenty-one non-fatal cases of wounds of the cord, all under the most favorable circumstances, but three fully recovered; sixteen had persistent paralysis or anæsthesia, or both, and two more were said to be improving when lost sight of. This justifies the general conclusion that in man we cannot hope for anatomical recovery after a lesion of the spinal cord. The case is different with the nerve-roots, however, after they have left the cord. In the event of injury these may be sutured with every prospect of restoration of function.

Fractures and dislocations. In compound fractures (usually gunshot wounds) there can be no doubt of the advisability of removing all splinters and foreign bodies. Of the fractures of the spine, those of the laminæ are the most important. From the analysis of ten published cases, the author arrives at the following conclusions: 1. The cause of this injury has generally been stated to be direct violence to the spine, but in four of my ten cases there was certainly no direct violence, and in only three is such distinctly described. Further, the frequency of this injury in conjunction with a fracture of the bodies indicates a similarity in the mechanism of their production. 2. The symptoms of fracture of the laminæ are by no means definite, and the only case, in which we can be satisfied that the diagnosis was made before death, owed its detection to the distinct lateral mobility of a spinous process. 3. The diagnosis is therefore difficult, and probably we can rely only on the following points: *a*. The cause, if there be a clear history of direct violence; *b*. The normal contour of the spine and the presence of lateral mobility of one or more of the spinous processes in conjunction with an obvious lesion of the spinal cord.

In these cases laminectomy is clearly indicated, if there be any symptoms of pressure on the cord.

Fractures of the bodies of the vertebræ and dislocations are considered together. The displacement in dislocation is said to be forward and downward; any other form may be regarded as a pathological curiosity.

Nature of injury to the cord. Such being the main varieties of injury to the spine, we may now ask ourselves what are the various methods in which the cord itself suffers, and we find these to be as follows:

1. By far most commonly there is approximation of the laminæ of the vertebræ above to the body of that below, causing crushing of the cord. Such crushing may be associated on the one hand with permanent pressure, as in true dislocation and in fractures which do not recoil; or, on the other, with temporary compression, as in diastases and in fractures which do recoil.

2. A fragment of bone may be driven back upon the spinal cord, but such a condition is exceedingly rare.

3. Equally rare, if not more so, is a condition presented in these two specimens, in which an intervertebral disk is, as it were, squeezed out from between the adjacent bones, so as to form a projecting shelf which compresses the theca.

4. And, lastly, the medullary symptoms may be mainly due to the pressure of hemorrhage.

The diagnosis of these different lesions is as yet impracticable. The condition known as gravitating hemorrhage is easily recognized. It is met with in cases in which some of the spinal bloodvessels are injured, and as the blood escapes it gravitates to the lowest portion of the spinal canal, causing paralysis by pressure. The paralysis rapidly extends upward as the collection of blood rises in the canal. The author would be inclined to perform laminectomy at the seat of injury and attempt to arrest all visible bleeding points, and give exit to the blood that could not be arrested. This procedure may be combined with paracentesis of the meninges in the lumbar region after Quincke's method, or, if this was not satisfactory, a secondary laminectomy at the lower part of the spine.

Practically there are three varieties of injury of the cord which call for treatment, namely, permanent pressure upon the cord, temporary compression of the cord, and hemorrhage. The latter is rare and difficult to diagnosticate. In the first condition it is possible to restore the normal lumen of the canal, but it is doubtful if any benefit will result, as the injured cord is not capable of regeneration. In the cases of temporary pressure, which constitute the majority, nothing could, of course, be obtained by operation. The author expresses the opinion that we are not yet able to treat with success the common injuries of the spinal cord. The author summarizes his conclusions as follows: In compound fractures, operate. In fractures of the spinous processes and laminæ, with injury to the cord, we also operate. In simple fractures and dislocations of the bodies of the vertebræ, if there is a reasonable probability that the injury is due to hemorrhage, operation is advisable; but in all other cases of this nature we cannot hope to do good save where the injury is below the level of the first lumbar vertebræ. In such cases, however, laminectomy is an eminently valuable surgical procedure.

THE ETIOLOGY OF CANCER, WITH ESPECIAL REGARD TO THE PROTOZOAN PARASITES OF CANCER.

SMITH (*New York Medical Journal*, January 5, 1895) after a careful historical study of this subject and its literature, describes the methods which he used and the results of his research, and says:

"Whatever else has been said, however, in relation to the subject, these two factors stand out in bold relief, and these may be offered as the writer's conclusions: (1) Cancer presents a course and clinical aspect analogous to those of formations of parasitic origin. (2) Within cancerous tissues occur bodies which closely resemble the different life-stages of protozoa, of sporozoa, of gregarinidæ."

That further study is necessary goes without saying, and that that study may be of the greatest value it should be of most extended character, both as to the methods of study and the tissues studied. New methods of staining, efforts at differentiation under all conditions of previous preparation of the tumors, the examination of tumors from all parts of the body and from individuals all over the world, the examination of tumors other than the strictly cancerous and of normal structures; all this is demanded, as well as the pursuit of the great desideratum, a culture method for the purpose of the growth and isolation of the protozoan parasites, if the subject is to be conclusively decided.

THE EXTIRPATION OF TUBERCULOUS PELVIC LYMPHATIC GLANDS.

SPRENGEL (*Centralbl. für Chirurg.*, 1894, No. 46) describes two successful extirpations of these glands. The steps of the operation are: 1. Incision over and removal of infected glands in the groin with exposure of the femoral vessels to Poupart's ligament. 2. The incision of all the ligaments down to these vessels in order to have them fully in view during the operation, and thus prevent accidental wounding. 3. Transverse incision along Poupart's ligament and freeing of the pelvic peritoneum. 4. Elevation of the pelvis. 5. Drawing back of the peritoneum so that the large vessels and all the gland are exposed. 6. Extirpation of the glands to the bifurcation of the common iliac. 7. Closure of the wounds by partial suturing and tampons.

The indications for operation are those common to tuberculous gland infections in other parts of the body.

The contra indications are: General tuberculosis, simultaneous disease of vital internal viscera; in cases where the infection has extended so far as to make removal of the centrally located glands impossible.

THE DIAGNOSIS AND SURGICAL TREATMENT OF CASES OF EMBOLISM AND THROMBOSIS OF THE MESENTERIC BLOODVESSELS, WITH REPORT OF CASES.

Under this heading, WATSON (*Boston Medical and Surgical Journal*, December 6, 1894) reports the following case. A woman, fifty years of age, had a history of dyspnœa and palpitation extending over several years. One week previous to admission she was seized with violent general colicky pains in the abdomen. This pain persisted intermittently for five days, and then became localized in the right iliac fossa, and diminished in severity. There had been no passage of flatus or feces since the beginning of the attack. Vomiting began two days before entrance, and persisted. There had been gradually increasing abdominal distention from the first. On admission the patient was conscious, face and extremities cold, cyanotic, and covered with cold sweat. The abdomen was greatly distended and universally tympanitic. The pulse was weak, thready, and irregular. Temperature subnormal. The operation showed a large amount of dark bloody serum free in the peritoneal cavity. The ascending colon was adherent to the parietal peritoneum, distended and deeply congested, and in places beneath its serous surface there were hemorrhagic extravasations from a point two inches above the cæcum to its juncture with the transverse colon. Scattered over this area were about a dozen spots of beginning gangrene, varying in size from a quarter dollar to a ten-cent piece. No occlusion was found. In the mesentery of this portion were felt a large number of apparent thrombi of the superior mesenteric artery or vein. The line of demarcation was well defined, but the patient's condition did not warrant resection. An artificial anus was, therefore, made. The patient died five days later. No autopsy was obtained.

With regard to diagnosis the author says there are certain symptoms which, when associated, are fairly, though not positively characteristic. He gives their order as follows: "(1) Colicky, very intense, not definitely localized, abdominal pain. (2) Bloody diarrhœa. (3) Subnormal temperature. Vomiting, if present (and next to pain it is the most frequent symptom), strengthens the diagnosis, as do also abdominal distention and marked prostration; but the first two or first three symptoms, when occurring in combination, are the only ones that can be called in any sense characteristic. Pain is the first symptom more often than any other, and its intense character is dwelt on by several authors."

In regard to operation the author says it may be concluded that laparotomy is indicated in all cases in which the symptoms suggest the nature of the disease, and in which the patient is not too greatly prostrated or has not some other fatal disease. There will probably occur a few in which the local and general condition is favorable to success. Resection with immediate suture is recommended where possible.

Elliot (*Annals of Surgery*, January, 1895) reports a case in which he removed four feet of intestine for infarction, probably due to thrombosis of the superior mesenteric veins, and in which complete recovery followed. The patient was a man twenty-five years of age, who had had a right inguinal hernia for four years, for which he had worn a truss at times. Ten months before, the hernia had been caught in the ring, and was returned with considerable difficulty and great pain. Sudden exertion since then has caused pain, but the hernia never returned. He had had pain in the right lower abdomen for two weeks. He felt a slight increase of pain while playing ball, went home and vomited, slept well all night, and ate breakfast as usual. His bowels moved, he felt well, and went to work. An hour later he felt pain in the right inguinal region while carrying a box, he went home and vomited. The pain increased and was relieved by a dose of morphine before he entered the hospital. On entrance his general condition was good; pulse, 56; temperature, 99.8° F. He was well nourished, but pale. He complained of constant severe pain over the whole of the lower abdomen, with acute exacerbations. An elongated bunch was felt over the appendix region. There was no distention or tympanites, and the inguinal ring was empty. He hiccoughed throughout the night, but had no nausea or vomiting. The pain continued paroxysmal, with intervals of almost entire comfort, although morphine had been withheld; the patient slept but little. He became rapidly worse, and when the operation was begun, at 11 o'clock, about twenty-four hours after the first severe pain, the patient was in poor condition. The operation disclosed a very dark gangrenous-looking small intestine with a free inguinal ring without inflammation. There was no evidence of hernia or any other constriction or twist, and the intestine was neither dilated nor contracted at any point. The unhealthy portion was deep red, and nearly black, having a slight gangrenous odor. Its walls were thickened by the presence of dark blood in the tissues. The peritoneal coat was without lustre, and so friable that it was easily torn by handling. It was separated from the healthy part by a widely diffuse shading at both ends. It was evidently a hemorrhagic infarction almost gangrenous. There were enlarged glands in the mesentery, and the mesenteric vessels felt thick and seemed to be plugged. Forty-eight inches of intestine were resected, and an artificial anus made, which was closed later, the patient making a complete recovery. The diagnosis of hemorrhagic infarction was confirmed by a careful pathological examination and analysis.

The second case reported was in a man nearly seventy, with atheromatous arteries, who had been previously paralyzed in both legs, but from which he had recently recovered. Three days before admission he had paroxysms of pain in the epigastrium; this became more intense; the abdomen was distended, and the transverse colon could be distinguished. The case was supposed to be an obstruction of the intestine (probably cancerous) in the descending colon. The operation disclosed a thrombosis of the mesenteric artery. The intestine was very friable, and an artificial anus was made. The patient died a week later. The autopsy showed the gangrenous part of the intestine had been caused by thrombosis of a branch of the mesenteric artery. The author believes immediate suture of the cut ends is the best method; but the doubtful condition of the gut and strength of the patient must be considered.

In conclusion he remarks: As occlusion of the mesenteric vessels is usually associated with heart disease or atheromatous arteries or cirrhosis of the liver, we must not expect much from operative treatment. Nevertheless, patients with symptoms of intestinal obstruction cannot be left unrelieved. Possibly more cases will appear with purely local lesions. They may offer a chance for an occasional surgical success.

OPHTHALMOLOGY.

UNDER THE CHARGE OF

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CATARACT EXTRACTION IN PERSONS OVER EIGHTY YEARS OF AGE.

HIGGENS (London), in a series of nine hundred and twenty-five cataract extractions, reports (*Lancet*, No. 3702) nineteen cases in which the patient was eighty years of age or upward. In all but two the results were entirely successful, in one partially successful, and one eye was lost with loss of the fellow eye by sympathetic ophthalmia. The operation usually employed was a small flap upward with iridectomy. In three, however, the flap was made downward, and in three no iridectomy was done.

Higgens finds that with cocaine there is less need to make any preliminary iridectomy, since there is with it no such necessity to hasten the operation as when the patient is under the influence of a general anæsthetic.

FILARIA LOA BENEATH THE CONJUNCTIVA.

At a recent meeting of the Ophthalmological Society of the United Kingdom, ARGYLL ROBERTSON (*Ophthalmic Review*, No. 156, p. 329) reported the case of a woman, thirty-two years old, who had resided in Old Calabar, on the west coast of Africa, for a number of years, but had been obliged to return home on account of intermittent fever and dysentery. Eight months before coming under observation the woman felt a filaria loa in one eye. The worm caused a sensation of pricking or quivering, and its movements were clearly recognizable. It wandered over the eye beneath the conjunctiva, which it raised into a small ridge as it moved; it sometimes left one eye, and could be felt to cross the bridge of the nose beneath the skin and find its way into the other eye; of late it had confined itself to the left eye. Sometimes the eye was tender and a little suffused after the appearance of the parasite. In the warm climate of Africa the worm made its appearance frequently, but on the woman's return to England it was only visible in warm weather, disappearing into the deeper parts on exposure to cold. When the parasite was visible the eye appeared normal, except for a small vesicle at the outer part of the conjunctival cul-de-sac, and tortuous movements could, under favorable conditions, be seen beneath the conjunctiva. The worm was kept in place with a finger, while the eye was cocainized. Then an incision was made in the conjunctiva and the parasite withdrawn. It looked much like a piece of fishing-gut, and was active for a short time, but it soon succumbed when placed in a weak solution of boric acid. It was 25 mm. long and 0.5 mm. thick; its head tapered slightly and its tail to a greater degree. Around the worm was wrapped a fine filament that appeared to be its alimentary canal. From the size of the animal it appeared to be a male. It was not known how it had gained entrance. No filaria were found in the blood.

Some Phases of Opacity and Luxations of the Crystalline Lens.

Thompson (*Ophthalmic Review*, No. 156, p. 313) contends that segmental opacities of the lower inner portions of the crystalline lens usually remain stationary for years, and rarely cause blindness. Annular opacity, or "arcus senilis lentis," is often encountered in persons under thirty years of age. Women seem to be more subject to it than men; it rarely passes beyond the periphery until after middle life, when it sometimes extends in the form of a minute speckled opacity of the whole anterior surface of the lens, again to become stationary, and seldom causing blindness. Cataract is occasionally cured spontaneously by liquid degeneration within the capsule. Congenital ectopia lentis is by no means a harmless anomaly. Its subjects are usually highly myopic, and have greatly reduced acuity of vision. It may cause loss of vision by glaucoma, and ultimately destroy sight by luxation of the lens downward, thereby inciting inflammatory reaction. Spontaneous luxation downward of the cataractous lens of an elderly person often takes place. It gives temporary sight to the patient, but the end is usually suffering and loss of vision. "Second sight" is a danger signal. It is not always caused by an inccrease in the conjugate axis of the lens incident to incipient cataract. It is frequently present long before the faintest sign or symptom of cataract. It is often brought on by long-continued congestion of the fundus, as indicated by numerous minute floating particles in the vitreous humor, by a relaxed suspensory ligament, and by luxation of the lens forward.

Low Degrees of Eye-strain a Source of Systemic Disturbance.

As the result of a systematic examination during a period of eight years of the eyes of all patients complaining of headache, giddiness, or of other symptoms that could possibly be induced as a reflex to an over-exercised ciliary region, Lowe (*British Medical Journal*, No. 1768, p. 1107) has found that low degrees of astigmatism are far more potent in producing such phenomena than the high degrees; although the reverse was observed in cases of hypermetropia. The explanation offered is that when mild astigmatism exists perfect vision can be obtained by an effort of focus, and the ciliary apparatus persists in this effort so long as its object can be accomplished. When the degree of astigmatism is, however, more pronounced, no effort of accommodation can bring about clear vision, and the ciliary apparatus gives up the attempt in despair. It is not then the astigmatism that produces reflex disturbances, but the effort to overcome it. It is further pointed out that the effect of peripheral irritation must depend not only upon the degree of such irritation, but also upon the excitability of the brain and the reflex centres. Reference is made to two cases in which the ciliary region was proved to be an epileptogenous zone, both patients completely recovering on the adoption of suitable lenses.

AN OUTBREAK OF OPHTHALMIA IN A BOARDING-SCHOOL.

SNELL (*British Medical Journal*, No. 1768, p. 1104) reports an epidemic of ophthalmia in a boarding-school containing 84 boys, of whom 38 were regarded as healthy, while in 39 the eyes, though not in many cases presenting any marked departure from the normal, were under the circumstances not considered quite well, and in 7 the diseased condition was marked. The vesicles were seated chiefly upon the inner surface (which was also reddened) of the lower eyelid, in some cases running the greater part of the length of the lid like a chain of pearls. In but few cases was the retrotarsal fold involved. The upper lids were less affected ; when they were, they had lost their polish and appeared often velvety, or, in some instances, as if the finest sand had been sprinkled on the surface; there was also in some cases an increased vascularity. There appeared in all an absence of perceptibie discharge. No discomfort was complained of, and, without everting the lids, hardly a case presented any abnormality. The outbreak was preceded by the prevalence of influenza, with which many of the boys had been affected, and ophthalmia had existed in the city and in a girls' boarding-school with which there had been communication through relatives. It is believed that the early cases may have been mild instances of ordinary catarrhal ophthalmia followed by the development of vesicular conjunctivitis, or the early instances may not have been imported, but have been merely an evidence of the prevalence of the disorder, the more marked cases at that time attracting attention. At the time of and previous to the outbreak the drains were open in close proximity to the school-house, the city authorities having the streets up for the purpose of a new drainage-system. The school itself presented no gross hygienic defect. The washing arrangements, with the epidemic once started, were favorable to its progress. The ventilation of some of the bedrooms was defective and the cubic space allotted to each boy could in some instances with advantage have been larger. Examination of the wall-papers and paints failed to disclose a source of irritation. In spite of hygienic measures, separate towels, etc., the disease spread widely, indicating either, in spite of the absence of discharge, that infection was playing a part, or that atmospheric agents(miasms) were at work, or both. Removal from the place facilitated recovery and did not lead to the infection of others. The outbreak, mild in character and unaccompanied by noticeable discharge or much visible redness, was of follicular type, and in cases in which recovery ensued no change in the conjunctiva resulted. Mild, as opposed to more stringent, treatment proved the better, applications of silver nitrate retarding rather than promoting recovery. Fresh air and the best hygienic surroundings were of the first importance.

DERMATOLOGY.

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The Therapy of Melanoma.

Lassar records a case of melanoma in which the internal administration of arsenic was followed by the disappearance of the tumor. The patient, a woman thirty-five years of age, had beneath the right breast a pigmented mole which, being rubbed by the corset stay, became the seat of a small tumor. Simultaneously the nævus began to grow peripherally. This small nodule was cauterized, probably with the galvano-cautery, but, instead of healing, renewed proliferation occurred. Because of this untoward result the patient absolutely refused to permit any further operative interference, and recourse was had to the internal administration of arsenic. Within the first three weeks involution began, but the patient neglecting treatment the tumor began to grow again. Upon the resumption of the arsenic retrogression again occurred. Under this treatment, continued for some time, the tumor completely disappeared; the pigment-mole remained, however. Unfortunately, owing to the refusal of the patient to permit the excision of a portion for microscopical examination, the diagnosis must remain in doubt. —*Dermatologische Zeitschrift*, Bd. 1, Heft 6.

The Management of Eczema.

In a paper read before the Section in Dermatology of the British Medical Association (*British Journal of Dermatology*, September, 1894), Malcolm Morris discusses the treatment of eczema, calling attention to the following points:

1. Are internal remedies required in eczema? If they are, what are the precise indications which should guide us in the use of them?

The author's view is that internal medication is not required unless some constitutional dyscrasia underlies the skin affection. In chronic eczema unaccompanied by constitutional dyscrasia, local treatment may be relied upon entirely. When the disease is acutely inflammatory, antimony is most valuable. In neurotic cases the sheet-anchor is opium; if this disagree, some other sedative must be substituted. If the neurotic element shows itself as depression, quinine may be combined with the opium advantageously. If the discharge be abundant, belladonna may be combined with quinine. Phosphorus, strychnine, and arsenic are useful in selected cases, but the last must be used with caution or harm will be done instead of good. Cod-liver oil and general tonic treatment are indicated when malnutrition and anæmia are present; iron, however, is contraindicated when acute inflammation is present.

2. The influence of diet in eczema.

The author does not believe that diet has any influence except indirectly.

3. What are the principles on which the local treatment of eczema should be carried out? Speaking generally, every case should be treated as if it were of parasitic origin. The objects aimed at in local treatment are, first, to destroy micro-organisms; second, to protect the inflamed surface from the air and further microbic invasion; third, to soothe irritation. The principles on which the local treatment of eczema is to be carried out are as follows: Soothe when the inflammatory process is acute; stimulate when it is chronic; in either case keep the parts continuously under the influence of antiseptics.

4. How is the tendency to recurrence of eczema in those predisposed to the disease to be overcome? Is there any plan of alterative treatment by which this result can be brought about?

Change of climate is often beneficial in this direction.

As to the various waters the author sums up his conclusions as follows:

1. No spring known to him has any specific action on eczema.

2. Such virtue as sulphur waters externally applied possess is due chiefly to the parasiticidal action and partly to the temperature at which they are applied.

3. Such virtue as sulphur, chalybeate, or arsenical waters possess when taken internally is due to their action in quickening the processes of metabolism, increasing the number of red corpuscles in the blood, giving tone to the nervous system.

RESORBIN AND ITS EMPLOYMENT AS AN OINTMENT-BASE.

LEDERMANN (*Monatshefte für Praktische Dermatologie*, 1894, Bd. xix., No. 2) reports his clinical experience with this new ointment-base, which is a fat emulsion consisting of almond-oil, wax, a minimal quantity of gelatin and soap, and a small quantity of lanolin. It is distinguished by an extraordinary penetrating power in comparison with lard and vaselin. On account of the water which it contains it acts as a cooling ointment and diminishes itching and inflammation. It may be employed with benefit in pruritus, especially the senile variety. On account of its powers of penetration it is useful for the removal of crusts in eczema, psoriasis, seborrhœa, especially when combined with salicylic acid, sulphur, and resorcin. The scales of ichthyosis are readily softened by it and the feeling of tension relieved. It may be used advantageously in all artificial inflammations where there is an inclination to the formation of erosions and rhagades. Incorporated with suitable medicaments it is adapted to the treatment of acute and chronic eczema, lichen ruber, and psoriasis. It is especially suited to the introduction of medicaments into the body as a base for iodine and iodide of potassium ointment. Mercurial ointment prepared with this base is well adapted to the treatment of syphilis.

The Treatment of Lupus.

In a paper read before the Dermatological Society of Great Britain and Ireland (*British Journal of Dermatology*, November, 1894), **Stopford Taylor** presents the following conclusions based on an experience in 250 cases of lupus vulgaris:

1. Excision should no longer be practised, except when lupus attacks a finger or toe and has proved rebellious to other treatment.
2. Scraping and cauterization with chemical caustics is the most satisfactory method of treating lupus of the trunk, extremities, and mucous membranes, and this plan may also be applied to the face when the disease is of trifling extent.
3. Scraping followed by the use of the thermo-cautery is quick, thorough, and efficacious, and has answered admirably in suitable cases of facial lupus, whether large or small areas have had to be dealt with.
4. Linear scarification is the remedy *par excellence* for extensive lupus of the face, where mutilation and scarring have to be avoided.

Infantile Syphiloid Due to Pityriasis Versicolor.

At a *séance* of the *Société Française de Dermatologie et de Syphiligraphie*, held July 12, 1894, MM. **Fournier** and **Sabouraud** reported a case of pityriasis versicolor of great interest from a diagnostic point of view. The patient was an infant, six weeks old, remarkably small and emaciated, having all the appearances of being the subject of hereditary syphilis. The lower extremities were covered with an eruption, confluent and arranged circinately, the general appearance at once awakening the suspicion of syphilis; and in fact, all who saw the infant regarded it as such. The eruption had commenced fifteen days after birth. At first it was limited to the ankles under the form of pustules, which became the centre of round red plaques. Suddenly it invaded the legs, and above all the thighs; in four days the whole external face of both thighs was covered with large red sheets, some of them rounded, others annular. The eruption was composed principally of erythemato-papular elements with whitish-gray centre. Of these elements the most represented circles of the diameter of a lentil to that of a 50-centime piece, even a franc. Some were isolated; the majority, however, by the coalescence of adjoining patches, formed plaques with polycyclic contents, one upon the upper part of the thigh being formed of four circles. Here and there were some very small papular elements upon which the epidermis was beginning to be elevated. Two peculiarities attracted attention: First, the color of the eruption. This color, at the periphery of the patches, was a bright red, florid, congestive, inflammatory, which disappeared upon pressure; it recalled the tint of certain erythemata.

Second, the central portions of some of these eruptive disks upon which one noticed the following: excentrically, a circular zone of a bright-red, which included a central portion, desquamating and ashy-gray in color, recalling the surface of sand-paper. Apart from the eruption there were no other evidences of syphilis; nor did careful examination disclose any signs of this disease in either of the parents. In examining the mother of the infant several patches of tinea versicolor were found on the thorax and between the breasts. At the time of examining some of the scales from these patches scales from the lesions upon the infant were examined, and, to the great surprise of the reporters, spores and mycelium similar to those present upon the mother were found.—*Annales de Dermatologie et de Syphiligraphie*, 1894, No. 7.

OBSTETRICS.

UNDER THE CHARGE OF

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PERFORATION OF THE AFTER-COMING HEAD IN DIFFICULT CASES.

A case in which great difficulty was experienced at delivery by reason of the large size of the fœtus is described by **DEMMER** (*Centralblatt für Gynäkologie*, 1894, No. 45). The patient had lost children in previous confinements, and the size of the fœtus was such that although the body was delivered in breech presentation, the head could not be brought to the pelvis; as the child had perished, it was necessary to perform craniotomy upon the after-coming head. The operator introduced the fingers into the mouth of the child, and then drew the lower jaw strongly down with a blunt hook; he then passed a trephine through the mouth directly to the base of the skull, and opened the cranium. The trephine was then removed, and the blunt hook introduced into the aperture made by it; the brain broken down, and the head pulled down by the hook and delivered with comparative ease. The head was very large and hard; the length of the child was 62 cm. The mother made an excellent recovery.

THE DISINFECTION OF THE HANDS, WITH A BACTERIOLOGICAL STUDY OF THE EFFICIENCY OF VARIOUS METHODS.

In a recent criticism upon the instructions given to midwives, in their text-books, regarding the cleansing of their hands, **ZWEIFEL** (*Centralblatt für Gynäkologie*, 1894, No. 47) criticises adversely the recommendation to use carbolic acid to cleanse the hands, as corrosive sublimate is thought the more efficient antiseptic.

With a view to determine the practical efficiency of various antiseptics, REINICKE (*Ibid.*) has made trial of various antiseptics and methods as follows: To determine the power of resistance of bacteria and their spores, threads of silk were inoculated with the spores, and then exposed for two hours to steam at a temperature of 100° C.; these germs were also placed in boiling water for a half-hour, when it was found in both instances possible to produce colonies of bacteria from spores so treated. Reinicke first tried trimming the nails smoothly and short, and brushing the hands thoroughly for fifteen minutes in hot water and green soap; this, however, was found unsuccessful in destroying colonies of bacteria with which the hands had previously been inoculated.

A further trial was made by brushing the hands thoroughly five minutes in hot water and green soap, and then thoroughly scrubbing for four or five minutes with a 3 per cent. or 5 per cent. solution of carbolic acid; this method, however, was found inefficient in destroying all bacteria upon the hands. A further trial was made by brushing the hands five, eight, and ten minutes with warm water and green soap; a solution of corrosive sublimate, 1:1000, was then employed, the hands being brushed in it for two, three, and five minutes, and then in chloride of ammonium, 2 per cent. or 3 per cent. This method, however, also failed in removing all germs. Sublimate soap was then employed, but was soon proven to be thoroughly inefficient. A further trial was made in the use of chlorine water, but this again proved inefficient. A 1 per cent. solution of lysol was alike a failure in destroying bacteria. Tricresol was no more successful in destroying germs, and set up an eczema upon the hands which was very unpleasant. Reinicke found the best result in the use of corrosive sublimate with alcohol. A very excellent preparation to cleanse the hands is a mixture of green soap and alcohol. After the obstetrician has thoroughly brushed the hands with this mixture for not less than five minutes, the hands are again thoroughly brushed in alcohol for the same time, and then carefully cleansed with corrosive sublimate solution, 1:1000. This was found to be efficient in destroying germs. Among the many agents which have been chosen for the disinfection of the hands, sand soap has found favor with some. This Reinicke gave a thorough trial, only to fail to observe any benefit from its use.

BACTERIOLOGICAL EXAMINATION OF THE VAGINAL SECRETION DURING PREGNANCY.

With a view to determine the presence or absence of germs in the genital tract of the pregnant patient, where no possibility existed of contagion, KRÖNIG (*Deutsch. med. Woch.*, 1894, No. 43) has made a series of examinations in the Leipzig clinic. His cases numbered forty-eight, and his results show that the natural resisting power of the tissues is the same to both spores and cocci; there is, however, a marked difference in the time in which various organisms introduced from without are destroyed by the tissues. Streptococci were killed in a very short time. Two days is the longest time in which germs introduced within the body remained alive. Clinically speaking, the genital tract may be considered aseptic in healthy women when from forty-eight to seventy-two hours have elapsed since the last examination.

THE PREVENTION OF PUERPERAL SEPTIC INFECTION.

In the *Münchener med. Woch.*, 1894, No. 42, **HOFMEIER** describes his results in his second thousand cases of labor as regards septic infection and the precautions necessary to avoid it. In his 2000 cases his entire mortality is six-tenths of one per cent., and from infectious disorders two-tenths of one per cent., and from infection arising in the hospital one tenth of one per cent. His morbidity rate in the 2000 cases was nine and three-tenths per cent., and of this but six and five-tenths per cent. arose from causes connected entirely with the puerperal state. Briefly stated, his precautions against sepsis consist in a preliminary prophylactic vaginal douche of corrosive sublimate solution 1:2000; this is repeated after each examination. Internal examinations are limited as much as possible, and intra-uterine manipulation is especially avoided. It is remarkable that the only cases of infection arising in the clinic were those in which it was found necessary to insert a hand or instrument within the uterus.

WALCHER'S POSITION, AND ITS PRACTICAL VALUE IN OBSTETRIC OPERATIONS.

In the *Archiv für Gynäkologie*, 1893, Band 45, Heft 2, **WEHLE** reports the interesting results at the Dresden clinic in employing Walcher's position during delivery in contracted pelves. This procedure consists in placing the patient upon her back at the edge of a bed or table, extending the thighs and allowing them to fall downward as far as possible. **WALCHER**, writing on the subject in 1889 (*Centralblatt für Gynäkologie*, 1889, p. 892), asserted that the conjugata vera of a contracted pelvis varies with the posture of the patient, while **KLEIN** (*Zeitschrift für Geburtshülfe*, Band 21, S. 74) found that the true conjugate and diagonal conjugate undergo a change of five-tenths of a centimetre in various postures of the patient. These observations have been repeated by others, and lately by **WEHLE**, who gives a tabulated list of twenty-five labors in contracted pelves. In these labors the patient was put in this position, and delivery was effected by version and extraction. None of the mothers died, and but two of them had fever during the puerperal period. Of the children, 80 per cent. survived. Of these twenty-five cases, seventeen had a conjugata vera of eight centimetres, and in these cases eighty-two and three-tenths per cent. of the children survived. Especial care was taken to maintain the membranes unbroken, that complete dilatation might be present before the beginning of extraction.

In a recent paper on "Posture in Labor," **JEWETT** (*Brooklyn Medical Journal*, 1894, No. 11) states that he has examined puerperal patients, finding a gain in the antero-posterior diameter of the pelvis, when the patients were in Walcher's position, varying from one-half to three quarters of a centimetre; in four non-puerperal pelves measured upon the cadaver the gain in this position varied from four to six millimetres.

FEHLING (*Münchener med. Woch.*, 1894, No. 44) has recently utilized Walcher's posture in three cases of contracted pelves, in two of which labor was induced; he found that a broad band or girdle passed beneath the axillæ was of comfort to the patients, as the posture tended to cause them to slip down from the bed on which they lay. They could not maintain this posture with comfort longer than two or three hours. Fehling makes an estimate of a gain of from six to eight millimetres in the diameters at the brim of the pelvis by this procedure.

THE COMPARATIVE VALUE OF THE SIGNS OF MATURITY IN NEWBORN CHILDREN.

In the *Archiv für Gynäkologie*, 1894, Band 48, Heft 1, FRANK describes fully the various signs upon which the question of a child's maturity at birth may be determined. From a review of the literature upon the subject, and from his studies in the clinic at Bern, he reaches the following conclusions: There is no one sign nor any one group of signs which point positively to the maturity of a newborn child; by studying each case for itself it is possible to arrive at certain conclusions regarding the proportionate development of the child. First in importance are the length and weight; next in value are the proportion between the circumference of the head and the girth about the shoulders. When the shoulder girth is greater than that of the head the child is almost invariably at term. If the circumference of the head be less than 32 cm., it is scarcely possible that the child is mature. A temperature lower than normal is also of value as indicating a prematurely born child, except in those rare cases where a child remains for some time partially asphyxiated. The growth of the finger-nails, the size of the epiphyses, and the presence of lanugo are of very little positive value. Data often given regarding the insertion of the umbilical cord, the time at which the cord separates, the weight of the placenta, the condition of the fœtal blood, and the size of the greater fontanelle, are of no value at all. In forming a positive opinion the physician will do well not to base it upon any one phenomenon, but to form a careful estimate of the entire group of phenomena present. It is oftentimes impossible to assert positively whether a child is at full term or whether a child is only viable.

FŒTAL AND INTRA-UTERINE RIGOR MORTIS.

This rare phenomenon is described in a case reported by LANGE, of Königsberg (*Centralblatt für Gynäkologie*, 1894, No. 48). The fœtus perished about four hours before birth, from asphyxia caused by the partial separation of the placenta, the attachment of which was in the lower portion of the uterus. The rigidity of the head and of the limbs occasioned difficulty at the moment of expulsion. Rigor mortis persisted twelve hours after the birth of the child. Post-mortem examination revealed ecchymoses in the tissues beneath the pleural and pericardial sacs. A small quantity of amniotic liquid had been aspirated into the air-passages, and the lymphatics of the abdomen were enlarged.

The literature of the subject embraces eighteen cases reported by FEISS (*Archiv für Gynäkologie*, Band 47, p. 391). An interesting medico-legal point is observed in the fact that rigor mortis occurring *in utero* passes off much more rapidly than does rigor mortis coming on in a child perishing at the moment of birth, or soon after. The time at which fœtal rigor mortis may come on varies from a quarter of an hour before delivery to seventy hours before delivery. Cases have been observed in which this phenomenon began during the birth, and in which various groups of muscles could be detected in this condition while the child was passing through the mother's birth-canal. As causes producing this condition in the fœtus, we have the death of the mother, fever in the mother, abnormalities in the nutrition of the fœtal muscles, and the transmission of poisonous substances from the maternal to the fœtal blood. Stumpf observed, in 1886, a child born from an eclamptic mother with a high grade of rigor mortis. Sänger extracted a child by Cæsarean section, four minutes after the death of the mother, who perished from sudden hemorrhage. This child was also in a condition of rigor mortis. Dohrn performed Cæsarean section upon an eclamptic patient in the endeavor to save the fœtus, and extracted, in four minutes after her death, a child in a condition of rigidity, but whose heart beat twenty times to the minute for a short time. The child made no efforts to breathe.

In the management of labor in head presentations when this phenomenon is present, difficulty may be experienced in delivering the shoulders, while in breech presentation the physician will find it hard to bring down the arms.

ACETONURIA DURING PREGNANCY.

VICARELLI reports, in a thesis published at Padua, the results of his studies in 137 patients in Acconci's clinic. He found in nine cases acetone in the urine, and observed that these cases were those of dead and macerated fœtuses. The acetone disappeared by the fourth day of the puerperal period. In two of the cases the amniotic liquid contained acetone. In three cases where the clinical symptoms of acetonuria were present, acetone was found in but one. A very interesting observation was that made upon a patient eight months pregnant with polyhydramnios. Repeated examination by auscultation failed to reveal evidence of fœtal life. Repeated examination of the urine, however, disclosed no acetone. When the patient was delivered the child was living, but with almost an entire lack of the cerebral hemispheres. The child perished in two days, and hydro-thorax and hydro-pericardium were found which had obscured the fœtal heart-sounds and also the fœtal movements. Vicarelli inclines to the belief that the fœtal tissues after death undergo a fatty degeneration, and that acetone develops as fatty acids do from the decomposition of albuminoids.

A CARCINOMATOUS UTERUS SUCCESSFULLY REMOVED THREE DAYS AFTER LABOR.

NOBLE, of Atlanta, Georgia, reports in the *American Gynecological and Obstetrical Journal*, 1895, No. 1, the case of a patient in labor, and suffering with carcinoma of the cervix. As the patient's condition made surgical interference impossible, the os uteri and vagina were cleansed and lightly tamponed with gauze. The patient was then put under the influence of morphine, and labor gradually proceeded, terminating spontaneously twelve hours afterward. The child, poorly nourished, died a few weeks later. From the time of labor the malignant surface was daily curetted and dressed antiseptically, the patient's temperature dropping slightly in consequence. Three days after delivery it seemed possible to remove the uterus *per vaginam;* accordingly, the patient was vigorously stimulated, the uterus was packed with gauze, the ragged edges of the cervix trimmed away, the os rolled in upon itself and closed. As the bloodvessels of the uterus were considerably enlarged from the patient's pregnancy, compression forceps and clamps were used constantly. It was impossible to tie off the broad ligaments, as the tissues were so swelled and puffy that a ligature could not be managed, and the uterus was so large that no room was left to tie. Two clamps were placed upon the left side, and three upon the right, and artery forceps were used to catch bleeding points. Adhesions were found in Douglas's pouch, and the descending colon was also densely adherent to the posterior surface of the uterus. The peritoneum and tissues over the bladder were brought together by compression forceps, and the wound drained with gauze. Beyond the shock caused by loss of blood the patient bore the operation fairly well. The radial pulse became imperceptible, but the patient rallied under transfusion of salt solution. The clamps were removed in forty-eight hours, with the exception of one which was left twelve hours longer. With the exception of a small ureteral fistula upon the left side, the wound closed well by granulation; this fistula healed spontaneously in eight weeks.

THE TREATMENT OF MYOMATA OF THE UTERUS COMPLICATING PREGNANCY.

JESSETT, in the *British Gynecological Journal*, 1894, Part 39, reports the entire removal of a fibroid uterus containing a dead fœtus. He also cites a number of similar cases. After removing the uterus the ligatures were drawn down into the vagina, the peritoneal flaps were brought together, and the vagina was packed with iodoform gauze. The patient made a good recovery. He also reports a case in which he performed abdominal section, hoping to remove the fibroid and pregnant uterus. After the abdomen was opened it was found that the uterus was so adherent to surrounding structures that it would be impossible to remove it safely. The abdomen was accordingly closed. The patient made a good recovery, and the tumor diminished slightly in size.

In reviewing his study of the subject, Jessett concludes that in sub-peritoneal myomata the surgeon is justified in opening the abdomen and enucleating the growths when they are growing rapidly. In cases of multiple sub-peritoneal and interstitial myomata, extirpation of the uterus is indicated. In interstitial or submucous myomata the risk to the patient is greater as she proceeds to the end of the period. In cases where the tumor is upon the cervix only, it should be either enucleated or removed by *morcellement.*

In the discussion upon this paper, ROUTH reported cases in which a fibroid tumor at the lower portion of the uterus, and apparently obstructing labor, had given place spontaneously to the child, and labor had gone on without assistance. HAYWOOD SMITH thought that the element of danger and the need for operative interference would depend upon the extent to which the uterus was affected by fibroid change. BANTOCK had frequently observed normal labors in patients who had fibroid tumors. He thought that only the largest tumors should render a case the subject of operation. Where multiple fibroids extensively alter the uterine wall the uterus cannot develop as the child grows, and abortion must result. R. T. SMITH described a case where Cæsarean section was performed, the patient perishing from hemorrhage. It was found that the placenta was implanted upon a portion of the uterus the seat of fibroid change, and that after the expulsion of the placenta hemorrhage could not be checked. He had also seen a case of miscarriage at the fifth month, where the placenta could not be properly removed. GODSON had frequently observed sub-peritoneal fibroids which did not interfere with labor. LEITH NAPIER called attention to the dangers of uterine rupture in labor occurring in fibroid uteri from degeneration of the uterine wall often present in these cases. Statistics showed that rupture of the cervix happened in 55 per cent. of the cases; of the body in 35 per cent., and of the fundus in 9 per cent. He recalled the case of a woman who had borne three children, who had a large fibroid on the posterior wall near the fundus. Each time there had been placenta prævia, and version was performed. After the third confinement the patient died.

ABDOMINAL GESTATION WITH DELIVERY OF A LIVING CHILD BY CŒLIOTOMY.

In the *British Medical Journal*, 1894, No. 1773, p. 1422, CULLINGWORTH reports a case of advanced extra-uterine pregnancy in an emaciated and ill-nourished patient who had borne one child and had one miscarriage. Seven months before admission to St. Thomas' Hospital her last menstruation had occurred, since which there had been symptoms of pregnancy, with several attacks of abdominal pain, followed by a discharge of bloodstained vaginal mucus. The abdomen was distended by a large, irregular swelling reaching to an inch above the umbilicus. Fœtal movements were felt and heart-sounds heard. The results of examination seemed to indicate a normal pregnancy; and the fact that the patient greatly improved in general health after admission to the hospital apparently confirmed the opinion. She left the hospital and returned about ten weeks afterward, soon after being seized with severe abdominal pain. She was evidently in labor, and the child was living. The finger could not be inserted into the cervix, and a sound in the uterus passed in three inches. She was accordingly subjected to abdominal section, and the fœtus was found in the peritoneal cavity enveloped in its membranes and in the lower portion by the remains of the ectopic sac. The membranes were incised, and the very small quantity of amniotic liquid allowed to escape The child was extracted by the head, separated from the mother, and soon cried lustily. The membranes were drawn out of the abdomen, and the greater part removed with scissors. The deeper portion of the sac was adherent, and the placenta was behind, below, and to the right. The amniotic cavity and the peritoneum were carefully sponged, dried, and the umbilical cord was again ligatured and cut short. The opening in the membranes was partially stitched with eight catgut sutures, and the abdominal wound was closed with nine deep and four superficial silkworm-gut sutures. No douche was employed, and no drainage-tube was used. Very little blood was lost, and the patient sustained but little shock. The child was a male, measured nineteen inches in length, and weighed five pounds. It was well developed and at the eighth month of gestation. The patient did well for about three weeks, when, on the twenty-fourth day, a chill occurred, followed by vomiting. The patient had fever and rapid pulse. On the twenty-sixth day the abdomen was reopened to remove the placenta, which presented in the wound. About eight or ten ounces of purulent fluid escaped from the amniotic sac; the placenta was cut away, and seemed to have been adherent to the posterior surface of the bladder and the uterus. The right broad ligament was tied with silk ligatures. A hot douche of boric acid solution was given, and a small portion of adherent omentum was ligatured and removed. The wound was closed with drainage. The patient collapsed, and died seven and a half hours after the operation. On examining the placenta, the greater part of it presented the normal honeycombed appearance without suppuration. The amnion had a slightly unpleasant odor, and was readily stripped off the fœtal surface of the placenta. The umbilical cord was soft and slightly fetid, and on opening its vessels they contained soft clots, becoming purulent. Upon post-mortem, the stump was found firmly secured by ligature which had been made in removing the placenta. The pregnancy had been in the right tube, which had ruptured. There was no evidence of septic peritonitis. There had been at some time adhesive peritonitis around the left Fallopian tube. In summing up his case, Cullingworth would not object to the method of treatment employed; he would, however, in another case allow the placenta to empty itself as far as possible through the cut cord before applying the ligature. He would also cut the cord as short as possible, and strip away as much of the amnion from the placenta as could be effected without violence.

GYNECOLOGY.

UNDER THE CHARGE OF

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OF NEW YORK.

Gonorrhœa in the Female.

Glünder (*Inaugural Dissertation*) examined eighty-seven sterile married women with reference to the influence of gonorrhœa in causing the condition. In sixty-three he obtained a clear history of former infection.

Charrier (*Inaugural Dissertation*) states that gonorrhœal peritontitis is characterized by the fact that it is confined to the true pelvis, and results in the formation of extensive adhesions. It is at first nearly always limited to one side, but soon involves the opposite side, menstruation being an active factor in spreading it. Peritonitis usually develops in the second or third week after the primary infection. Gonorrhœal may be complicated with puerperal septic peritonitis. Experimentally the author was unable to produce a pure infection of the peritoneum in animals by injections of pus containing gonococci. In spite of these negative results he still believes that they produce a specific form of peritonitis in the living subject.

Resnikow (*Centralblatt für Gynäkologie*, No. 32, 1894) reports an interesting case of gonorrhœal rheumatism in a young woman (previously a virgin) which developed four days after marriage with a man having an acute urethritis, and before any local evidences of gonorrhœa appeared. The affection was confined to one knee-joint, and was unusually severe, persisting for two months. The writer believes that the specific bacteria may have been absorbed through the raw surface left after laceration of the hymen, and that the case furnishes a possible argument in favor of the theory that gonorrhœal arthritis is a wound infection.

Colombini (*Centralblatt für Gynäkologie*, No. 32, 1894) has found that exposure to the action of a three per cent. solution of ichthyol for five minutes hinders the development of gonococcus colonies. Applying this fact in the treatment of specific vaginitis, he treated thirty cases with applications of five and ten per cent. glycerin solutions. The same strength was used within the urethra and the uterine cavity in all cases with the most satisfactory results.

Janet (*Nouv. Arch. d'Obstétrique et de Gynécologie; Centralblatt für Gynäkologie*, 1894, No. 50) is extremely pessimistic regarding the radical cure of gonorrhœa. In some cases he thinks that is impossible. He believes in prompt abortive treatment with permanganate of potassium, which he has found to be quite satisfactory. That the disease is so much more obstinate in the female is probably due to the influence of menstruation, which renders the genital tract more susceptible to fresh infection. Two months (!) after infection is stated to be the shortest time which a man should allow to elapse before he again indulges in coitus, or marries.

Vaginal Drainage in Cœliotomy.

Moulonguet (*Arch. Journ. de Chir.; Centralblatt für Gynäkologie*, No. 50, 1894) pleads for the adoption of vaginal in the place of abdominal drainage, since it is in accordance with the natural law of gravitation. Combined vagino-abdominal drainage is unnecessary. Iodoform gauze is the best drain, since it prevents infection from the vagina; tubes become clogged, and also compress the bowel. Drainage through Douglas's pouch is indicated in cases of pelvic suppuration, extensive adhesions, and partial hysterectomy; also as an index of oozing when hemorrhage is feared.

[While we coincide with the writer in his belief that drainage *per vaginam* is the ideal method, we do not think that the iodoform gauze drain can be depended upon to indicate the presence of hemorrhage after abdominal operation.—H. C. C.]

Drainage of Douglas's Pouch.

Boisleux (*Centralblatt für Gynäkologie*, No. 50, 1894) concludes an extended paper on this subject with these deductions: Draining of Douglas's pouch by means of rubber tubing is indispensable in all cases in which the peritoneal cavity is opened *per vaginam*, except after total extirpation of the uterus, when a sufficient channel is left for the escape of purulent fluids. Such drainage should be employed in all cases of pelvic suppuration. Due care must be exercised to prevent subsequent infection through the tube, by keeping the vulva protected with antiseptic gauze. If these precautions are observed, there are few abscesses which cannot be opened per vaginam without extirpating the uterus. Tubes and ovaries which are only slightly diseased should be spared as far as possible.

The writer believes that the peri-uterine adhesions can be separated more easily by the vaginal than by the abdominal route. The statement that adherent adnexa can be enucleated more easily when they are actually seen does not carry weight, since such organs must usually be pulled out from their beds before they can be seen, so that after all the finger is really the "eye of the gynecologist."

ADVANTAGES AND DISADVANTAGES OF DRAINAGE BY MIKULICZ'S METHOD.

CONDAMIN (*Province Méd.; Centralblatt für Gynäkologie*, No. 50, 1894) believes that the Mikulicz tampon is the most efficient means of arresting hemorrhage in cœliotomy when others fail. But, after the separation of extensive adhesions, or where it is desirable to promote the encapsulation of septic foci, gauze-strips are preferable, since the Mikulicz tampon cannot be packed into small cavities like loose gauze. When the tampon is used considerable care must be exercised not to cause intestinal obstruction from undue pressure. Another disadvantage is the greater liability to ventral hernia.

SALIPYRIN IN UTERINE HEMORRHAGE.

KAYSER (*Centralblatt für Gynäkologie*, No. 51, 1894) reports sixteen cases of uterine hemorrhage (not due to pregnancy or malignant disease) which he treated with salipyrin in doses of fifteen grains repeated thrice daily. In three cases of metrorrhagia it had no effect, but in twelve of menorrhagia the flow was checked to a marked degree. The drug seems to be of special value in climacteric hemorrhages. There were no unpleasant consequences aside from ringing in the ears.

PREGNANCY MISTAKEN FOR OVARIAN CYST.

REVERDIN (*Gaz. Méd. de Paris*, No. 9, 1894), with admirable candor, reports this error in diagnosis, which seems to have been quite excusable. He had removed a large ovarian cyst from the patient a year and a half before. She returned at the end of that time with a fluctuating abdominal tumor, most prominent in the right side. She had menstruated at irregular intervals since the operation. On opening the abdomen numerous firm intestinal adhesions were found, in the separation of which the gut was so injured that it was necessary to resect five inches. On exposing the tumor it presented the ordinary appearance of a cyst, and was punctured with a trocar, a quantity of turbid fluid being removed. When the trocar was withdrawn a loop of umbilical cord appeared in the opening. Hysterectomy was performed, and the patient was discharged, well, at the end of two weeks. Pregnancy had advanced beyond the fourth month, and there was marked hydramnios, the presence of the latter condition and the adhesions having led to the error in diagnosis.

[It is to be regretted that more cases of this character (and who has not narrowly escaped the same mischance?) have not been reported, since they would serve as a valuable guide to the profession in the avoidance of similar errors. The reporter loses nothing by his frank confession, but rather wins the increased respect of his *confrères.*—H. C. C.]

DISAPPEARANCE OF THE UTERINE CAVITY AFTER CURETTAGE.

FRITSCH (*Centralblatt für Gynäkologie*, No. 52, 1894) reports the case of a primipara, aged twenty-five years, who was curetted several weeks after delivery on account of persistent hemorrhage, and remained in good health for over a year afterward, except that she never menstruated, nor did she have any molimen. When seen by the writer she appeared to be perfectly well and had had no disturbances referable to the amenorrhœa or suggestive of a premature climacteric. Examination showed an infantile uterus, without enlargement or tenderness of the ovaries. As it was impossible to introduce a sound through the small dimple which represented the os externum, the latter was incised, when a probe could be passed for a distance of four-fifths of an inch, beyond which point no further progress could be made except with the aid of a knife. The probe was then passed two inches further, when its point could be felt at the fundus by external palpation. An attempt was made to dilate the narrow tract with tents and gauze, but soon after they were removed the condition was the same as at first, and had remained so six months later. The writer infers from the history that the curettage had been performed so vigorously that a considerable portion of the muscular tissue of the uterus was scraped away, when the opposite raw surfaces became adherent. In this connection he calls attention to the fact that removal of the uterus alone in young women produces the menopause more certainly than when the ovaries and tubes are extirpated and the uterus is left.

TOTAL EXTIRPATION BY THE VAGINA FOR LESIONS OF THE UTERINE APPENDAGES.

In a paper with this title (*Amer. Journ. Obstetrics*, November, 1894) JACOBS, of Brussels, makes a strong plea in favor of vaginal hysterectomy. His total mortality in 255 cases is only 1.96 per cent. Although his operations were originally confined to cases inoperable by the abdominal method, he now regards total extirpation *per vaginam* as the ideal method for all cases in which it is necessary to remove both tubes and ovaries. Among his patients were many who had previously submitted to palliative operations, or even to abdominal castration, without relief. As regards the relative danger of the two operations, it is stated that the mortality is more than one per cent. less after the vaginal, and even this difference is unfairly stated, because so many more difficult cases belong under the latter category. The objections to vaginal extirpation are raised mostly by those who are not practically familiar with it. It is in those cases in which the pelvic organs are matted together by firm adhesions, where the abdominal surgeon is often compelled either to abandon the operation or to leave it incomplete, that the vaginal method gives the most brilliant results. Even when it is impossible to break up all the adhesions and to remove the adnexa, collections of pus may be opened and drained, and the adhesions often soften and disappear, while pain disappears. To leave the uterus after removal of the adnexa is to leave the patient incompletely cured, so that a secondary hysterectomy may be necessary.

Unilateral extirpation of the adnexa *per vaginam* may be readily performed with the aid of forcipressure, even during pregnancy. It may be necessary to do a secondary hysterectomy. Vaginal hysterectomy by morcellation is admirably adapted to the removal of fibroids, even when the tumors extend to the umbilicus. Complete prolapse of the uterus in women of advanced age is thus treated by the writer, extirpation being supplemented by pelvic operations upon the vagina.

Physiology and Pathology as Illustrated by Menstruation and Gestation.

Barnes (*Glasgow Med. Journal*, December, 1894), in an inaugural address on this subject, concludes that gestation and menstruation throw much light upon the etiology, nature, and treatment of many diseases. The phenomena best explained in this way are the influence of increased nervous and vascular tension in the production of new tissue; absorption of the latter, the results of hemorrhage and of blood-changes and metabolism. Those who neglect this study are apt to attribute all disorders of functions and secretions to some actual organic change, instead of referring them to the depressed condition of the whole system. The author concludes with the suggestion that it is only those who combine gynecological with obstetrical observations who are in the best position to observe and generalize on this subject.

PÆDIATRICS.

UNDER THE CHARGE OF

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Assisted by

Thompson S. Westcott, M.D ,

OF PHILADELPHIA.

Biting the Nails.

Bérillon (*Medical Week*, 1894, p. 357) reiterates his previously expressed opinion that onychophagia and similar habits are generally associated with degeneracy. The frequency of nail-biting varies greatly in different institutions; in some, two or three out of every ten children are addicted to this habit. A careful examination invariably reveals signs of degeneracy. Such children are usually less healthy in appearance than others, presenting deformities of the skull and anomalies of the teeth and ears; and they often exhibit a marked antipathy to physical exercises and games requiring effort. They write poorly and show marked inferiority in manual dexterity. They are slow to learn, and are incapable of continuous application; in short, they always exhibit an inferiority in some direction or other. The usual corrective measures prove unavailing, in the majority of cases only hypnotic suggestion seeming to be capable of effecting a cure.

THE DIAGNOSIS OF SPORADIC VARIOLA.

In a note on the spread of infectious diseases, **NIVEN**, Medical Officer of Health for Manchester (*Lancet*, 1894, ii. p. 192), emphasizes the importance of the recognition of slight cases of smallpox. The frequent mistakes between smallpox and chicken-pox can be avoided by attention to the following rules: (1) Adults rarely have chicken-pox. If two adults appear to have chicken-pox in one house, the medical attendant should suspect smallpox. (2) Properly vaccinated children under seven years of age very rarely have smallpox. (3) With few exceptions, children attacked with chicken-pox experience no initial sense of illness. With smallpox they almost always have well-marked illness. (4) The distribution of the eruption is different. In slight smallpox the eruption is almost always on the face and limbs, sparing the abdomen and front of the chest. In chicken-pox there are generally a large number of pocks on the front of the chest and abdomen. (5) The eruptions are different in character. To mention no other points, the eruption of smallpox is tolerably uniform in size and round in shape. The eruption of chicken-pox is very variable in size, and many of the pocks, on the body especially, are of oval shape. (6) The eruption of chicken-pox is itchy in a great many instances; that of smallpox is, at first, not so.

CASES OF INFANTILE DIARRHŒA COMPLICATED BY ACUTE NEPHRITIS.

In a short note **TURNER**, of Liverpool (*The Practitioner*, October, 1894, p. 263), reports three cases of infantile diarrhœa complicated by fatal acute nephritis. All three children were aged under a year, and had suffered from diarrhœa "for more than a fortnight." Another fact of interest is that they were all rickety children, but their family histories showed nothing noteworthy. They were all seen for the first time within a period of four days. The treatment adopted was mainly that recommended by Dr. Burney Yeo in his *Manual*. Under this treatment all three patients seemed to be improving; but on the fourth day patient No. I. was noticed to have swollen feet, and was puffed under the eyes. On the following day this was more marked, and the mother noticed a diminution in the amount of urine on the napkins. Despite appropriate treatment, the child died on the fourth day with the usual symptoms of uræmia. It was noted that coincidentally with the œdema of the feet and legs there was an improvement in the diarrhœa, and bile-staining was almost absent. Patient No. II. ran a very similar course; and here a small sample of urine obtained was found to be albuminous. In this case death took place on the fifth day after the appearance of œdema. Patient No. III. lingered a week, and before the end œdema was extreme. It may be stated that on the first appearance of renal symptoms the minute doses of brandy were stopped, and ether or ammonia given instead. In all three cases the heart's action was good till within a few hours of the end. Scarlet fever at any time previously was positively excluded. The author is inclined to exclude the influence of exposure to cold and of the drugs used in treatment, and asks whether the ptomaïnes elaborated in the intestine might not have irritated the kidneys after the free discharge by the bowel had lessened and thus thrown more excretory labor upon the kidneys.

ACUTE GONORRHŒAL VULVO-VAGINITIS AND URETHRITIS IN AN INFANT AT BIRTH.

MORGENSTERN (*Medical Record*, February 2, 1895, p. 143) reports an interesting case under this title. The child was first seen at the age of three weeks, when it was stated that urine had been voided scantily since birth, the little that was passed coming away a drop at a time. On local examination nothing could be seen, except possibly a slight reddening of the parts. A probe introduced into the urethra encountered no obstruction, and the bladder was found not to be distended. One week later the mucous membranes of the labia majora, nymphæ, vestibule, and anterior portion of the hymen were reddened and engorged and exquisitely tender, and a thick, creamy, muco-purulent discharge was observed. More urine than formerly was voided, but the quantity was still very small. The mother admitted that she had been treated for a long time for a vaginal discharge similar to that from which the child was suffering. As the child slept with the mother, the chances of direct infection were thus most favorable. Gonococci in great numbers were found in the discharge. Under ordinary appropriate treatment a cure was effected in a short time.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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THE PATHOLOGY OF EXOPHTHALMIC GOITRE.

We would call the attention of our readers to a carefully written article upon the pathology and treatment of Graves's disease by PUTNAM in *Brain* (*September*, 1894, p. 214), in which the various theories of its pathology are discussed in considerable detail. Three such at present claim adherents: (1) That the symptoms of Graves's disease are mainly toxic in origin and are due to excessive or perverted secretion by a diseased thyroid gland; (2) That they are purely neurotic in origin; and (3) That they are more or less reflex in origin and due to irritation of the thyroid and cervical nerves.

After reviewing the evidences, Putnam concludes as follows: "To sum the whole matter up we have two questions to bear in mind as regards the etiology of Graves's disease: First, what is the underlying predisposing cause? Second, what is the mechanism by which this cause acts? The underlying cause I believe to be an undue excitement of the quasi-physiological arrangement called into play frequently as a part of emotional excitement. This arrangement represents the channel into which emotional excitement naturally pours itself after rising to a certain height, and its anatomical centre is in the medulla oblongata and related parts.

"As regards the modes in which this nerve arrangement underlying the symptoms of Graves's disease is actually disturbed they may be many, and among them there seems it may be that poisoning by the thyroid secretion is one active agent. This is, however, a matter of some doubt, because we have no right to assume that if the symptoms of Graves's disease are habitually due to the toxic action of the thyroid secretion, they are still capable of being excited in the same form without the aid of that secretion; and if we can get, as it appears, the greater part of these symptoms under *quasi*-physiological conditions, then it would seem unnecessary and somewhat gratuitous to invoke the thyroid secretion as an habitual cause of them in disease. Nevertheless, it would appear that the physiological action of the thyroid extracts does excite a series of symptoms somewhat resembling those of the affection with which we are dealing."

The same number of *Brain* (p. 246) contains a critical digest of the recent literature on exophthalmic goitre by MAUDE, at the close of which he says: "It is obvious that all over Europe there is a gradual growth of the opinion that this symptom-complex is due to the production (or non-elimination) in the thyroid itself of some toxin, which acts on the whole nervous system, even to the periphery, though the brunt of its action falls on the vasomotor centres of the medulla and some neighboring centres. . . . . The question of the exact *rôle* played by the thyroid change is difficult; it is clear that all morbid changes in the thyroid are not operative to produce Graves's disease, but all the cases (in which the gland has been properly examined) show two common factors—cell proliferation and diminution of colloid· Even so, we are in the dark as to whether this morbid change is primary or secondary to some vasomotor disturbance elsewhere, and also as to whether the alternation in thyroid secretion will produce the same effect in a healthy nervous system; probably some nervous systems are more susceptible than others to the toxic influence, just as they are to alcohol and lead; in fact, the susceptibility of young women to plumbism and Graves's disease is strikingly similar."

CYCLIC ALBUMINURIA.

PAVY applied the name "cyclic albuminuria" to certain rather unusual forms of albuminuria occurring intermittently in apparently healthy individuals. The albumin was commonly found in the day urine, but not in that secreted during the night.

An interesting case of this condition has recently been investigated by TEWES (*Arbeiten aus der pädiatrischen klinik zu Leipzig, Cf. Berl. klin. Wochens.*, 1894, No. 17, 410). The patient was an apparently healthy boy of ten years. The chief object of Tewes's investigation was to determine the influence or muscular activity upon the albuminuria. So long as the boy lay quietly in bed albumin was absent from the urine, but even though he remained in bed and in the horizontal position, muscular exertion always caused its appearance. Similarly, when up and about as usual, added muscular exercise in the shape of gymnastics always materially increased the amount of albumin present. On the other hand, the quantity of albumin excreted bore no relation to the quantity of nitrogenous food taken. The albumin found in the urine was determined by analysis to be always serum albumin.

THE IDENTITY OF CANCRUM ORIS WITH THE HOOF AND MOUTH DISEASE IN CATTLE.

SIEGEL (*Deutsche medicinische Wochenschrift*, 1894, No. 19) concludes his article relative to the identity of cancrum oris in man and the "hoof and mouth" disease in cattle. In a number of post-mortem examinations made by him in men and children affected with aphthous sores in the mouth a peculiar bacillus was found. An examination of a number of dead cattle showed the same microbe. In the internal organs during the acute stage of mouth disease is found a specific bacterium, and by inoculation with this other animals can be similarly infected. The bacterium is found especially in the liver and spleen, generally during the first ten days, seldom later. It is rarely seen in the blood. The bacillus is described as a short rod or linked coccus from 0.5–0.7 μ. in length. The coloring in its middle part is much fainter than at its end. This coloring is unique, and prevents its being mistaken for other bacteria. It is not movable. This bacillus grows in gelatin without liquefaction on plates in the form of colonies, with sharp blue and white edges, which later change to a yellowish shiny hue. In stab or scratch cultures no liquefaction occurs, and on the surface can be seen a soft bluish film. It grows also on potato, blood-serum, and bouillon. The growth is comparatively slow. Gram's staining is unsuccessful. Doves, cattle, pigs, and goats are suspeptible to inoculation. The results, at least the production of external aphthous manifestations, are not uniform.

HYGIENE AND PUBLIC HEALTH.

UNDER THE CHARGE OF

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JEWISH AND CHRISTIAN BUTCHERY.

In 1891 DR. DEMBO, of St. Petersburg, was commissioned by the Russian Government to report on the various methods of slaughtering animals practised in the different countries of Europe, from the humanitarian and the hygienic points of view.

The results of his inquiries were published last winter, and have been translated into several languages; while at Berlin they have been verified scientifically and practically by Dr. Krüger in the laboratory, and by Mr. Hoffmann, the Director of the Municipal Slaughter-houses, which are well known as the most perfect in the world. The methods in question are: (1) The Jewish Schechita, or complete severance of the carotids and jugulars, and consequent rapid withdrawal of the greatest possible volume of blood. (2) The Gentile methods, in which attempts are made to deprive the animal of consciousness by (*a*) stunning or (*b*) by pithing; the former including the English hammer and pole-axe; Brunneau's mask which, besides blindfolding the ox, holds in position a nail which is driven through the skull by a blow from the hammer; and Sigmund's, in which a percussion shot is substituted for the nail.

Decomposition begins sooner in the less stable tissues, and first of all in the blood; the more rapidly and completely, therefore, the vessels are evacuated the longer does the meat remain fresh and wholesome. The entire extinction of life is marked by the loss of electric irritability and the appearance of *rigor mortis*, due to the action of lactic acid on the myosin. Dr. Krüger found that in a number of rabbits, some of which were killed after the Jewish method, and others by stunning followed by "sticking," the average time after death at which rigor set in was one hour and ten minutes in the former, and two hours and thirty-five minutes in the latter; decomposition commencing on the thirteenth and eighteenth days respectively, the temperature having been meanwhile maintained between 3° and 7° C. (37.5°–44.5° F.).

The vasomotor paralysis that follows stunning tends to retain the blood in the dilated vessels; while in the *Schechita* arterial tone is unimpaired, the rapid reduction of pressure withdraws fluid from the tissues, and the flesh is as firm in two hours as after other methods in ten.

Against these palpable advantages of the Jewish method the charge of cruelty has been persistently urged, although it must be evident that the sudden cutting off from the brain of its blood-supply, except the small quantity brought by the vertebral arteries, must involve almost instant loss of consciousness. The epileptiform convulsions, which have been taken to indicate intense agony, are the consequence of cerebral anæmia and evidence of unconsciousness. Even the movements of the pupil on being touched, which may be observed fifteen seconds after the *Schechita*, are merely reflex; it is well known that fowls will run and ducks swim without their heads, and Dr. Dembo, by stimulating the appropriate points, has induced the trunkless head of the ox to open its mouth and protrude its tongue, all suggestion of consciousness being absurd.

Indeed, there is reason to believe that a beast slaughtered in the Jewish manner does not retain consciousness for more than from three to five seconds, and it is very doubtful whether it feels pain for half that time.

On the other hand, it is seldom, indeed only by a lucky chance, that the ox falls under the first blow of the hammer, five or six being about the average number required, and then it must not be forgotten that unconsciousness does not always accompany motor paralysis.

But barbarous as pole-axing may be, Dr. Dembo has proved that the French method of pithing is simply diabolical.

The knife is commonly supposed to divide the medulla above the decussation, thus paralyzing every faculty simultaneously. This, however, is well nigh an anatomical impossibility, and, as he has demonstrated by numerous post-mortem examinations, it is the cord only that is actually reached. Motor paralysis is complete, but circulation and respiration proceed as before, and consciousness remains intact long after the process of flaying, etc., has commenced.

Mr. Hoffmann has already introduced the *Schechita* into the Municipal Slaughter-houses at Berlin, and is supported in a report on the question by no fewer than fifty University professors, one hundred veterinary surgeons, and a large number of master butchers throughout the empire.

SMALLPOX AND VACCINATION.

DR. JOSEPH PRIESTLY gives some interesting facts concerning smallpox in an ill-vaccinated community (*British Medical Journal*, August 18, 1894). Of 362 children who passed through the Leicester quarantine, only a fourth were vaccinated. There were 347 cases of smallpox at Leicester, and among them was not a single case of a vaccinated child under ten years of age. Among these cases were fifteen which showed forcibly the beneficial effects of primary vaccination extending into adult life. The beneficial effects of vaccination are well shown by the comparative length of stay in the hospital; the average stay of the unvaccinated cases was 44.2 days; that of the vaccinated was 28.6—a difference of more than fifteen days. The average stay of those who had been vaccinated was even less—26.8 days, while those who had had a previous attack were confined only two weeks. The beneficial effects are shown again in mitigating the severity of the attack. Among the vaccinated cases the percentage of severe attacks was 11.20 against 88.70 for the unvaccinated. In nearly two-thirds of the unvaccinated cases complications arose in the course of the disease, whereas of the vaccinated and revaccinated cases less than a fourth were complicated.

DR. HILL, of Birmingham (*British Medical Journal*, August 11, 1894), reports that of 651 cases of smallpox occurring in the previous quarter at Birmingham, no less than 560 were vaccinated persons. Of these latter, 26 died —a death-rate of 4.6 per cent. There were 63 unvaccinated cases with 18 deaths—a death-rate of 28.6 per cent. The remaining 28 cases were of persons concerning whom there were doubts as to the question of vaccination. Five of these died— a mortality of 17.9 per cent.

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APRIL, 1895.

AN EXPISCATION OF ACUTE DELIRIUM.

By H. C. Wood, M.D., LL.D. (Yale).

There is probably no department of medicine in which the scientific study of disease affords so little of mental satisfaction as in that which treats of insanity. The reason of this is not far to seek; as I have formerly insisted upon, the various insanities to which names have been given by authors, as though they were distinct diseases, are in great part nothing more than symptom-groups, one of these groups often containing two or more diseases, and one disease reappearing in two or more groups. As in the former time, physicians talked about dropsy as a disease, and now this alleged disease is resolved into heart, renal, and kidney affections, so at present we speak of manias and melancholias, which in the aftertime will, we hope, be resolved into various organic affections.

Our knowledge of cerebral pathology in its relation to cerebral action is so imperfect that it seems almost impossible for the alienist to get much firm ground under his feet; indeed, it still remains doubtful whether it will ever be possible to get a complete pathological basis for our study of insanity, unless, indeed, some great genius shall arise and invent new methods of investigation. The matter is made more difficult and the value of our present knowledge more problematic by the fact that we have no definite, positive proof at present that corresponding lesions produce in different individual brains the same symptoms; whilst we do know that different lesions will produce closely similar symptoms. Nevertheless, by splitting off here and there a group of cases whose pathology has been made out, we may hope little by little to obtain more and more definitude of knowledge, and continually reduce in number and importance the symptomatic disease-groups of unknown pathology.

In chronic insanity such a long time usually elapses between the commencement of the process and the death of the individual that secondary brain-alteration must continually obscure any original structural deviations; pathological study in chronic insanities is therefore more hopeless than in the active disorders. It is plain that in an attempted elucidation of the essential nature of insanity very little value attaches to reports of cases in which recovery has occurred, and in which, therefore, no pathological study has been possible. The literature of medicine teems with the reports of such cases; indeed, there has been such an accumulation that it is hardly probable that our knowledge can be advanced by further records unless these records be directed to the elucidation of one or two clinical points which seem yet in doubt, as, for instance, the question of bodily temperature in acute mania.

Again, reports of fatal cases in which no exhaustive microscopic examination has been made are plainly of no more value than are those of cases in which there has not been a post-mortem. In fact, such reports are worse than useless, because they may well be misleading. Further, when it is remembered that it is possible for an insanity to be of toxic origin the importance of bacteriological and chemical studies of fatal acute insanities becomes manifest; but such studies are as yet very few.

It seems to me, also, a matter of great importance that a clear consensus of professional opinion should be reached as to what are the problems which are at this time next in order of discussion; or, in other words, what questions the alienist should now strive to answer.

There are commonly recognized a number of acute insanities which may for our purposes be separated into two groups: Group 1, acute melancholia, acute stupor; Group 2, acute mania, acute delirium (typho-mania or Luther Bell's mania), confusional insanity, *i. e.*, the mania which follows shock of injuries or surgical operations, febrile disease or certain chronic poisonings, such as alcohol, cocaine, morphine, etc., intoxications mania due to direct action of poisons.

The questions which seem to me to be most pressing for answer on the part of the alienist are: First, what is the relation between acute melancholia and primary dementia? Second, what is the difference between acute mania and acute delirium or typho-mania? Third, do the different manias which follow acute diseases rest upon one pathological basis, or are they of diverse nature; and if this be so, is it possible at this time to cleave off from the block one or more distinct diseases?

In the present article I do not propose to discuss the relations between acute melancholia and primary dementia, but shall confine my attention to what we may term the "manias," *i. e.*, Group 2. Among recent writers there is much difference of opinion as to the relations between acute delirium and acute mania; some teaching that the two disorders are essentially distinct, others that they are simply different grades of the same disease.

A study of the nature of acute delirium does not so closely involve a study of the relations between these two disorders as would an investigation into the nature of an acute mania. The opportunities for early post-mortems are so much more frequent in acute delirium than in acute mania that there is much greater hope of elucidating its nature than there is of discovering that of acute mania, so that the immediately pressing question seems to me to be as to the nature of acute delirium. Nevertheless, I shall discuss briefly the clinical relations of the two affections.

The symptomatic differences between acute delirium and acute mania are found in the suddenness of the onset of acute delirium, in the rapidity of development of typhoid symptoms, and especially in the presence of a pronounced febrile reaction. In a typical case of acute mania there is, preceding the outbreak of symptoms of exaltation, usually a period of depression, and this period, it is true, is often, perhaps usually, wanting in cases of acute delirium; but it would seem certain that acute mania may develop without previous depression, and that an acute delirium may be preceded by melancholic symptoms; indeed, in the case hereinafter narrated the primary mental condition was one of depression, and the early delusions were depressive, being of persecution.

So far as concerns the mental symptoms the differences between the two diseases are therefore rather in regard to intensity than as to character. How is it with the bodily symptoms? Some writers affirm that in one disease the patient very rarely, if ever, dies, whilst in the other the natural course is toward an early death. Assuredly illogical, however, is it to base diagnostic difference on the occurrence or non-occurrence of death; and assuredly, also, cases which seem in the onset to be instances of the graver malady do occasionally recover. It would seem, therefore, that so far as the question of prognosis is concerned the difference between acute mania and acute delirium is difference in degree rather than in kind; and the question naturally arises, Is this true of all the physical symptoms so called, or, in other words, are these physical symptoms, like the mental symptoms, different simply in intensity and not in kind?

If there be any salient symptomatic difference in the two disorders, it would seem to be in regard to the bodily temperature. In acute mania the temperature is generally stated not to be distinctly altered; whilst in acute delirium the fever rises to a considerable height. Krafft-Ebing lays great stress upon this difference, affirming that the rise of temperature in any case of mania to 100.5° F. indicates very strongly the presence of delirium acutum. The severe cases of acute delirium are so sudden and rapid in their course that I think they are more frequent outside than within asylums; whilst acute manias are so prolonged and so difficult of management that the great majority of cases pass into the hands of the asylum-alienists. In order to get, if possible, the experience of these practitioners upon the point in question, I have written to some of those whom I conceived to have had largest experience, and received in most instances courteous, but often not very satisfactory, replies.

Dr. Morgan Cloud, first assistant physician in the Kansas State Insane Asylum, writes: "In cases of acute mania admitted here the temperature ranges from 99.5° F. to 100.5° F. in the majority of cases; in a few cases the temperature rises as high as 103° F. for a short time only, and I am inclined to think that in these cases there is some other cause than acute mania for the extreme high temperature, perhaps tonsillitis, bronchitis, or some similar affection. We admit very few cases of acute delirium here, but I notice a much higher temperature in such cases than in acute mania. The temperature rises as high as 103.5 F."

The most elaborate and interesting series of charts which I have received were sent by Dr. H. A. Tomlinson, superintendent of the St. Peter State Hospital of Minnesota. In this series are included—eighteen cases of acute mania in which the temperature ranged from 98° to 100.5°, except when there were distinct complications such as tonsillitis, erysipelas, etc.; only rarely in these cases was the temperature up to 100°: two cases in which without any apparently sufficient cause the temperature went up to 102°: one case in which two hours after the entrance into the hospital the temperature reached 102.2°, the rise probably having been due to excitement of coming to the hospital, especially as there were retention of urine and constipation (the day after, the temperature fell to 100.5°): one case in which without any other complication than constipation the temperature reached 102.8°, the case ending in complete recovery: one case in which the temperature reached 101°, with the result of final recovery: one case in which the temperature was almost all the time below 100.5°, but without obvious cause once went to 102.2°. (At the last report this case was not improving.)

Contrasting with these cases of acute mania the charts sent by Dr. Tomlinson, marked acute delirious mania, we find that in one case the temperature ranged from 97.2° to 103.4°; in one case the temperature reached 106.7°, death occurring a few hours after entrance; in one case, in which death occurred on the twelfth day, the temperature was almost always below 101°, once rising to 104°, and one day reaching 106.5°; in one fatal case the temperature ranged from 98.5° to 104.5°.

So far these records of acute delirious mania contrast strongly with those of acute mania, but in other cases sent by Dr. Tomlinson the temperature sheets correspond very closely with some of those of acute mania. Thus, in one case, finally ending in dementia, the range of temperature during the first nine days was from 99° to 101.5°; there was then erysipelatoid inflammation of the arm, with a rise of temperature to 105°; after this complication had subsided for many days the temperature ranged from 99° to 101.5°; this being followed by a very irregular temperature, which some days rose to 103°. In another case which ended in recovery the temperature for forty-one days ranged from 99° to 101.8°, going higher for a short time on two occasions, once directly after the patient was brought into the hospital, when the temperature reached 102.6°, and once when there was an attack of erysipelas, when the temperature mounted to 103.4°. In still another case, which also resulted in recovery, for five or six weeks the temperature was between 99° and 100.5°, shooting up, however, on two or three occasions without obvious cause to 101.8° and 102.4°.

These observations seem to me to be very strong evidence that so far as concerns the temperature no sharp fixed line can be drawn between acute delirium and acute mania. It may be argued that the diagnoses made by Dr. Tomlinson were not in these cases accurate. If this were true, it would go far to prove that clinically no positive, sharply defined diagnosis or diagnostic rules separating the two disorders are possible. The very numerous temperature sheets furnished by Dr. Tomlinson show at once how wide his field of experience and how carefully he gleans it. The result of our inquiry so far seems to be that no diagnostic difference can be made out which shall enable it to be said with positiveness in all cases: this is an acute mania; this is an acute delirium.

In attempting to discuss the pathology and nature of acute delirium it seems to me essential to get, in the first place, some solid ground under our feet and then to examine the general territory. I therefore now report the following case, which was studied with sufficient care and results to give a foundation in fact.

Mr. F. was a man of rather feeble and distinctly neurotic organization, with a tendency to worry excessively, both as to business and domestic affairs. August, 1893, he consulted Dr. Thomas Potter, who found evidence of nervous exhaustion without any very distinctive symptoms, and advised complete rest, which advice was not taken. Through the early part of September there was sleeplessness, with depression of spirits, and about the 18th or 20th Mr. F. began to be very suspicious and to express the belief that he was being watched by detectives. September 22d he was very nervous, and finally left the bank where he was employed, during banking-hours, and walked to his father's house, about six miles in the country, because, as he afterward said, he was afraid to go in the cars as he believed detectives were in the cars looking for him. On reaching home Mr. F. was in a very exhausted condition; during the following night he was sleepless, and declared to his wife that he saw lights in the windows and the faces of detectives looking into the room; finally, he got up and went down stairs, starting to go out of the house, but shrunk back because he said he saw detectives at the windows and doors, also the flashing of bull's-eye lanterns on the lawn. He was seen by me in consultation September 25th; his conversation was entirely rational; he recognized completely that the things he had seen at night had no real existence, but affirmed that he had seen them with great distinctness, and that at the time he saw them he believed in their real existence. According to the father, there had been distinct signs of mental confusion in his talk, but he had not failed to recognize where he was or the personality of his friends, except once or twice at night. The temperature was 99.5°; pulse weak; tongue relaxed and coated. During September 26th, Mr. F., while alone in his room, began to pray out loud in a broken, interrupted manner, growing louder and louder in his tone until he was screaming at the top of his voice, when his father came into the room. Mr. F. then went into a spell of furious kicking and screaming, lasting ten minutes, and followed, according to the statements of those about him, by a prolonged muscular rigidity.

According to the reports of the nurse, during the day of September 27th he talked rationally, ate heartily, until eight in the evening, when he had a hysteroidal attack similar to the one the day before. September 28th, during the night, his sleep had been interrupted by delusions, which continued more or less into the day, though at times he seemed rational; toward evening he again became hysteroidal. September 29th, temperature taken at midnight, 99.4°. September 30th condition not much changed, except that he either would not or could not urinate, but had to be catheterized. The evening of the 30th he became wildly maniacal and excessively violent, so that it required the combined strength of three persons to restrain him; in an hour this passed into a condition of quiet moodiness. October 1st he was quiet and apathetic; when aroused his speech was incoherent and his mental functions much confused; this confusion was especially marked in the evening, and in the early night he had a sudden attack in which there was apparent unconsciousness, with widely opened eyes, dilated pupils, strabismus, clonic spasms of the right side, lasting about five minutes, followed by rigidity of the neck-muscles and clinching of the hands. A moment after this he sprang up on the bed, perfectly wild, dancing, shrieking, yelling, etc. After this time he never became rational except for about fifteen minutes on October 2d. On October 2d the axillary temperature was taken and found to be 100.2° after a paroxysm; later, 99.5°. Later, on October 2d, he talked incessantly, was irrational, refused food or to urinate. October 3d axillary temperature was taken once, 99.4°. He seemed to be getting weaker, and had one violent paroxysm in the evening; also, involuntary passages in the evening. October 4th I was requested to see him again; found him refusing food, violently maniacal, fighting, attempting to escape, struggling, requiring four men to keep him in bed. I had him removed the same day to the University Hospital. October 5th he was more quiet, but almost collapsed; much of the time there was a muttering delirium; once during the day he asked for a cup of coffee. October 6th he had irregular, alternating periods of semi-stuporous quiet, of muttering delirium, and of furious mania, with fightings and strugglings. He recognized me, however, in the evening, but could not talk rationally. The symptoms of weakness steadily increased. At 3 A.M., October 7th, evidences of collapse became very marked; from this time forward he was much of the time stuporously quiet, but whenever aroused was violent; at 1 P.M. he died in coma.

From October 4th until his death the axillary temperature registered, with all kinds of irregularities, from 100.8° to 102.8°; most of the time it was between 101.5° and 102.2°.

At the autopsy there was found extraordinary congestion of all the sinuses and membranes of the brain, with distinct serous exudation in the pia mater, and even some few very small fibrinous flakes. The dura mater, the base of the brain, and the bloodvessels were all apparently normal. Fluid was taken by Dr. A. C. Abbott, in charge of the Bacteriological Department of the Laboratory of Hygiene of the University of Pennsylvania, from whom subsequently the following letter was received:

"OCTOBER 10, 1893.

"DEAR DR. WOOD: I have not succeeded in finding *anything* either by microscopic or culture methods in the material taken from the meninges of your case on Saturday. Very truly yours,

"A. C. ABBOTT."

The following exhaustive report upon the brain was made by Dr. John Guitéras, Professor of Pathology in the University of Pennsylvania:

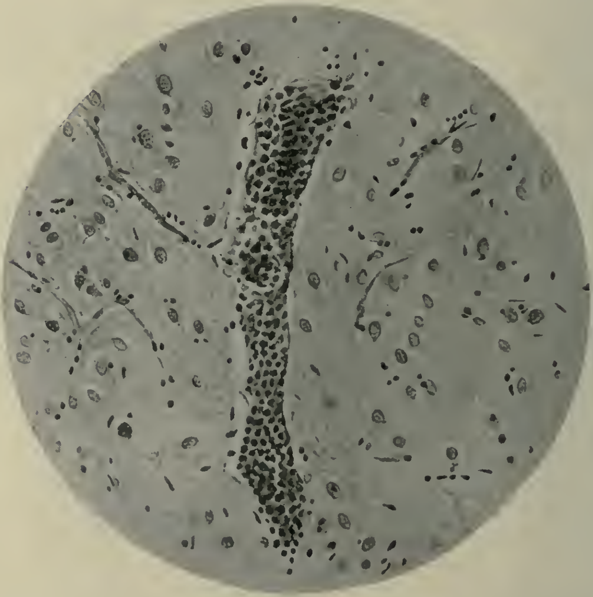
"The brain came under my observation after laying in Müller's fluid twenty-four hours. No gross lesion was apparent, except that the membranes were congested but not opaque. Any slight opacity present may have been made invisible by the action of the fluid. Fresh sections into the brain-substance showed well-marked congestion. The gray matter of the cortex was darker than normal, and the white substance well dotted over with red points. After hardening in Müller's fluid sections for microscopic examination were cut from the frontal lobe, the transverse convolutions, and the occipital lobe.

"The lesion found is an acute inflammation in the anterior portions of the brain. The inflammation is most marked in the anterior portions of the frontal convolutions. From thence it gradually diminishes until it is nearly absent in the occipital lobe. The inflammatory process affects the bloodvessels, the lymph-channels, the connective tissue. In these structures it is evidently a primary affection. The ganglionar system is not structurally affected in corresponding measure. In fact, the ganglion cells are generally normal, even in close proximity to vascular areas that are deeply involved. The features of this inflammatory process are peculiar, and may throw some light upon the question of the source of leucocytic infiltration in general.

"*Frontal lobe.* Vascular and lymphatic changes.

"Many of the pial vessels and of the cortex and white substance present a pronounced perivascular round-cell infiltration. This is perhaps best marked at the bottom of the sulci, but not always so. The inflammatory changes are not uniformly distributed. In the same microscopic field we find bloodvessels affected with others that are not. Some vessels may be traced, showing parietal cellular infiltration up to a certain point, and the remainder of the vessel is normal. Portions of the meninges over one convolution may show evidences of inflammation, whilst other portions are not affected or but slightly so. In the latter we notice that the perivascular spaces are wider than normal, and present isolated lymphoid cells; in the former the accumulation of these cells may form bands along the vessel, of greater width than the vessel itself, as shown in the illustration. In close proximity to one another we find, then, all stages of this morbid process. This statement applies to the deeper portions of the cortex and to the white substance as well as to the meninges, though the cellular infiltration is never so great within the brain-substance as it is in some places in the pial covering.

"The bloodvessels affected are generally distended with blood. The capillaries and smaller vessels in the brain-substance are prominent features in the microscopic field; either because of their over-distention or because of the perivascular drift of round cells, or, as is frequently the case, for both reasons combined.



A bloodvessel in the deeper layers of the gray matter, engorged with blood, showing especially at the lower end clusters of round lymphoid cells.

"The round cells in the perivascular spaces are mononuclear lymphoid cells of the ordinary size; some very small ones are found, and some of the larger size.

"Though we have here an opportunity to study this process in all its stages, either by comparing the posterior with the anterior portions of the brain, or even within the areas of greatest development of the lesion, we do not see anywhere any preparation for an extravasation of leucocytes. There is nowhere to be seen a peripheral drift of leucocytes within the vessels, nor any accumulation whatever of such cells in the lumen of the vessel. It is impossible, then, to conceive that these vessels, containing nowhere (exceptions to be mentioned subsequently) any excess in the normal proportion of leucocytes, should be the source of the enormous perivascular aggregation. It is very evident that the lymph-spaces in the walls of the bloodvessels are the primary seat of the cellular accumulation. When we do find, exceptionally, an excess of lymphocytes within a bloodvessel the appearances point clearly to an inwandering from the perivascular spaces. Besides the fact that in all stages the number of wandering cells is far greater outside than inside the vessel, we have direct evidence of the inward passage of such cells. The process takes place in the following manner: The lymphocyte exerts a peculiar influence upon the endothelial cells of the lymph-space and of the bloodvessel. The endothelial cell swells and its nucleus becomes paler. The swelling projects, extending around the lymphocyte in the same fashion as the uterine mucous membrane grows around the ovum. The lymphocyte is thus furnished with a coma of refracting protoplasm. This is carried forward into the vessel with the cell, bulging into the lumen. This coma is apparent around the lymphocyte even after it has penetrated the wall of the vessel, unless several cells are found together, in which case it almost disappears. In one instance a distinct track is left in the wall of the vessel, indicating the line of passage behind the corpuscle.

"It is interesting to note that the lymphocytes exert the same peculiar influence upon endothelial cells in other localities. This is seen at times in the lymphocytes that are found in the pericellular spaces of the ganglion cells. The change in the endothelial cells, however, is by no means general. Lymphoid accumulations are found frequently in contact with endothelial cells that are in all respects normal.

"There is nowhere to be found in these tissues any tendency to liquefaction or suppuration, such as would be shown by degenerative changes, by polynuclear formations, by very close packing of leucocytes, with a tendency to softening in the centre of the accumulations. On the contrary, we find frequently in the lymph-spaces where lymphocytes are grouped together fine protoplasmic prolongations that form a fine reticulum within the said spaces.

"No bacteria or other abnormal contents are found in the bloodvessels.

"The lymphocytes are found in excess throughout the reticular groundwork of the brain-substance. They are frequently found in contact with the Deiters's cells; and one, two, or three are found in many of the pericellular spaces of the ganglion cells.

"The Deiters's cells appear to be more numerous than normal, and large sizes are more frequent than in health.

"*The ganglion cells.* These do not show any degenerative changes. The pericellular spaces are large and contain frequently one or more lymphocytes. The ganglion cell is occasionally displaced by the manipulation, and its outline is consequently somewhat distorted. This appears to be due to the serous infiltration in the pericellular spaces. The protoplasm shows no structural changes. The nucleus stains in the usual manner and the nucleolus is distinct. There are no vacuolations. The granular reticulum of the nucleus is not so pronounced as it should be. Otherwise these ganglion cells appear to be normal.

"There is no evidence of degeneration of the myeline. The picture given by Weigert's stain does not differ from that of the healthy brain. In this case it is evident that the drift of lymphocytes has taken place along the lymph channels toward certain bloodvessels.

In regard to the pathology of acute delirium there is not an absolute unanimity amongst recent writers, but the condition is believed by Krafft-Ebing to be one of acute hyperæmia, with irritation, followed by exudation and symptoms of paralysis due to pressure upon the nerve-elements. The post-mortem appearances are well summed by R. Percy Smith in Tuke's recent *Dictionary of Psychological Medicine*, as consisting of "intense cerebral hyperæmia in the excited period and œdema in the later stage. The cellular elements are said to be swollen, opaque, granular, and to stain badly, and the pericellular and perivascular spaces to contain red or white corpuscles; and there are sometimes white lines along the vessels from extravasated leucocytes, and occasionally small extravasations of blood in the brain-substance."

It will be noted that in the case which I have just reported the pathological changes found by Professor Guitéras are accordant with the description of Dr. R. Percy Smith. I have once before seen a similar case with similar results at autopsy, and it seems to me that it must be considered as firmly established that there is a group of cases presenting symptoms of violent mental delirium ending in death, in which the lesion is an acute peri-encephalitis. That the acute peri-encephalitis is the essential lesion is strongly confirmed by certain clinical facts. As has been distinctly pointed out by Dr. George H. Savage (*Medical Press and Register*, 1891, vol. ii.) and other alienists, some cases of acute delirium pass on into general paralysis. The lesion of general paralysis is chronic peri-encephalitis, and it is natural that the acute disorder should sometimes pass into the chronic.

Further, it is well known that locomotor ataxia not rarely ends in chronic peri-encephalitis, just as chronic peri-encephalitis not rarely has locomotor ataxia as a secondary complication. A case which I reported some years ago demonstrated that acute delirium may develop in locomotor ataxia. The clinical and pathological facts agree in showing that there is a clinical and pathological relation between acute delirium and general paresis. The conclusion just reached does not in any way involve the further conclusion that *all cases* which present the clinical features of acute delirium, and are labelled by alienists and clinicians as acute delirium, are of the nature of an acute peri-encephalitis. It does not in any way account for the production of the peri-encephalitis.

In a paper read before the Philadelphia Neurological Society in 1890 Dr. J. H. Lloyd strongly argued in favor of the view that acute delirium is really toxæmic. It is entirely conceivable that a toxic agent may produce, by a direct action upon the cells, cerebral symptoms closely resembling those of acute delirium and at the same time superinduce typhoid symptoms. Again, it is entirely conceivable that a toxic agent may produce an acute delirious condition by provoking a peri-encephalitis. For clear thinking, it is essential that the two methods of action of a poison be distinguished.

As above stated, analogy indicates that a peri-encephalitis of acute delirium may be produced in various ways. It is generally acknowledged that there may be a meningitis which is due to sunstroke or other cause not bacterial nor even toxæmic; but it is equally certain that a meningitis may be produced by some constitutional poison like that of sepsis or of epidemic cerebro-spinal meningitis. Just so, I believe, an acute peri-encephalitis may be produced by a poison or may be the outcome of an intense functional excitement or other cause not toxic.

There have been recorded a few bacterial studies of cases of alleged acute delirium. Those with which I am familiar have been gathered together by Dr. Charles K. Mills in volume iii. of the *Transactions of the Congress of American Physicians and Surgeons.* The most important case is that of Rasori—a case, however, in which the symptoms were not in absolute accord with those typical of acute delirious mania; the difference being in that the attack came on with persistent headache, irregular pupils, opisthotonos, and without fever. At the autopsy Rasori found in the sub-dural liquid a small bacillus, which he believed to be peculiar, and which injected into rabbits caused death with symptoms of acute septicæmia.

In a second case, reported by Drs. Charles S. Potts and Berlet, the symptoms occurred in a man who had used whiskey and morphine in excess, and who also was suffering from an open carbuncle. At the autopsy, in the brain cortex there were found perivascular exudation and leucocytes in the lymph sheaths and perigangliar spaces, and cultures from the cerebro spinal fluid made by Dr. D. Braden Kyle demonstarted the presence of the Streptococcus lanceolatus and also of the Staphylococcus pyogenes aureus and albus. Evidently this was simply a case of septic peri-encephalitis.

In another case reported by Dr. James R. Hunt, in which there was abscess of the kidney, Bacillus pyocyaneus was obtained from pure cultures from liquid in the lateral ventricle. Evidently, this again was a case of septic poisoning.

The only evidence that is at present forthcoming to show that there is a peculiar bacterial disease resembling acute delirium is that given by Rasori. In the case which I have reported in the paper no bacillic organisms could be found in the sections of the brain, and the very careful culture-experiments of Prof. Abbott demonstrated that the cerebral liquid was free from them. There was evidently no septic poisoning in the case, and it seems to me to demonstrate, as far as one case possibly can, the existence of a non-septic and non-bacterial acute peri-encephalitis. Moreover, the clinical history of the case, in the comparatively slow development of the mental symptoms, in their coming and going, in the character of the delusions, and in the early absence of fever or constitutional physical evidence of disease, seems to me almost sufficient to prove that the attack was not bactericidal. A delusion-of-persecution bacillus may not be unthinkable, but it certainly is at present unknown ; and it seems to me that the conclusion is fully established that there is what may be termed idiopathic acute peri-encephalitis, constituting at least one form of the so-called acute delirium.

I do not see how any physician can read the reports of cases which have been published as instances of acute delirium without having had the suspicion strongly aroused that under this heading have been described by various practitioners cases representing several affections. Of these diverse diseases which have thus been recorded under the one name, three types have already been considered in this article, namely, septicæmia with septic delirium, septic peri-encephalitis, and idiopathic peri-encephalitis. A fourth type seems to me to be easily discerned, namely, acute brain-exhaustion, or, in other words, a violent form of confusional insanity. It is probable that this type includes a very large proportion of the reported cases of acute delirious mania, as alienists of wide experience believe that all acute delirious mania is of this character.

Thus, in his letter replying to my inquiries, Dr. John B. Chapin, of the Pennsylvania Hospital for the Insane, writes that he believes that "acute delirious mania is an acute neurasthenia or the culminating of the active nervous exhaustion ending with a psychical explosion." Dr. John Curwen, of the State Hospital for the Insane at Warren, Pa., in a letter, after detailing two cases which he believed should be considered as acute delirium, and in which great relief and final recovery were obtained by free use of stimulants and feeding, says: "My own conviction has been that these cases were the result of great nervous and physical depression giving rise to the mental excitement, and were to be treated to meet these conditions in the most active and positive manner, or death would close the scene in about ten days."

That the term acute delirium or acute delirious mania has been used to cover various conditions, and that among these conditions is a peculiar cerebral exhaustion, are further shown by the following quotation from a letter written by Dr. H. A. Tomlinson, in which he says:

> Basing my opinion on the observation of a large number of cases, I believe the term "acute delirium" a better one than "acute delirious mania," because the condition is not in any sense one of mania, although it may be added to mania, and where it is not fatal and recovery does not take place mania may follow. Acute delirium has, in my experience, occurred in the course of all forms of insanity in their early stages, but it has been independent of the insanity, a condition *sui generis*. The natural history of this condition of delirium is very similar to that of the same condition in so-called "typhoid pneumonia," or the delirium of typhoid fever where the poison has spent its effect principally on the nervous system. Where this

delirium exists as *apparently* a primary form of insanity it has in my experience almost invariably been preceded by prolonged mental over-strain, shock, or physical exhaustion; and the immediate antecedents of the attack have been constipation, insomnia, exhaustion from refusal to take food, with a variable period of confusion accompanied by either exaltation or depression. In those cases dying within the first ten days we almost invariably find some degree of organic change in the kidneys or heart, besides the intense congestion of the brain and its membranes. While I was an assistant in this hospital three years ago I had seven successive cases of acute delirium, all of whom died within a week after admission. At that time, however, we had no trained nurses and the temperature-records were not accurate enough to warrant me giving them to you. In discussing these cases too little attention is given to the history of the individual before the onset of the delirum. My experience would bear out your suggestion that *clinically there are regular gradations from mania into delirium, and from delirium into mania.*

November 6, 1889, I read before the College of Physicians of Philadelphia a paper on "Insanity Following Acute Disease," in which I supported the proposition that these insanities çonstitute one disease-group having a uniformity of symptoms as characteristic and as complete as is usually seen in mental diseases, and resting upon a common pathological basis of disordered brain nutrition and exhaustion without anatomical alteration sufficiently gross to be detected by our present methods of study. In accordance with this proposition it was proposed to call all these cases "Confusional Insanities," including in the group the "stupidity or primary curable dementia," of Krafft-Ebing, the "Wahnsinn" of the same author, and the "delusional stupor," "mania hallucinatoria," and "confusional insanity" of various writers. Without discussing in detail, it may be well to summarize the proofs of identity of these affections.

1. If the cases vary much in their details, the general scope of symptoms and the general course of the disorder are identical: there are always mental confusion, hallucinatory excitement, loss of mental power, with similar constitutional symptoms; the cases nearly always ending in complete recovery if there have not been pre-existing organic disease of the kidneys, arteries, or other vital organs, and when death occurs there is similar absence of lesions in the cerebral cortex.

2. A similar mental condition with similar symptoms is produced by starvation and exposure, as in shipwreck.

3. The belief that the insanity has a specific relation to the poison of the disease which it has followed involves the absurd proposition that there occur as sequela to various acute diseases a large number of distinct specific insanities which offer the same general symptoms, pursue one general clinical course, and, when death occurs, agree in their pathological results; it being, moreover, possible to have these alleged distinct insanities produced not only by diseases which are connected with the presence of bacteria or other poisons in the body, but also by the shock of surgical operation or injury at a time when there is no septic poison

in the system, and even by overwhelming emotional disturbance during a healthy state of the organism.

In the short time which has elapsed since the publication of my paper upon confusional insanity a number of articles have been published. The following notes upon these papers seem to me of interest as showing in a short space the general drift of medical opinion and the difficulties which lie in the way of a clear perception as to the truth of the subject.

Dr. Henry M. Hurd (*American Journal of Insanity*, vol. xlix.) appears to believe that there are three distinct insanities following acute disease, respectively due to shock, to specific poisons, and to anæmia or nervous exhaustion. He illustrates the first of these causations by a case which followed removal of the ovaries; the second by a case which occurred after pneumonia; and the third by a case following typhoid fever. As I read these reports they do not seem to confirm the etiological theories of Dr. Hurd.

In an article on acute delusional mania, Dr. G. W. McIntyre (*Northwestern Lancet*, vol. xiii.) differentiates acute delirium by the suddenness of onset, the violence of the excitement, the rapidity of the exhaustion, and the presence of a febrile reaction in which the temperature follows no definite course. He says it is commonly produced by shock or exhausting physical disease when the temperature gets as high as 103°.

Dr. Alex. Robertson (*Journal of Mental Science*, vol. xxxvii.) finds the essential symptoms of acute dementia to be rapid failure of mental power with hallucinations; rapidly developed stupor; emaciation; feebleness of circulation; coldness and blueness of the extremities; brown tongue, etc. It is worthy of note that Dr. Robertson has obtained good results by the application of a double skull-cap containing hot water (110°).

Mr. C. Norman (*Trans. Royal Acad. of Medicine*, Ireland, 1890, vol. viii.) states that Korsakoff, of Moscow, thinks that alcoholic neuritis often exists in connection with confusional insanity from alcohol. Norman believes that the insanity which is described by a patient's friends as having "come on out of sleep" is always confusional insanity. He quotes Salgo as saying that any case in which hallucinations occur must be rejected from simple mania, and distinguishes confusional insanity from acute mania by absence of exaltation and increased rapidity of thought—from acute dementia by absence of complete stupor.

In an elaborate paper, Dr. John Ferguson, of Toronto (*Alienist and Neurologist*, vol. xiii., 1892), gives analyses of large numbers of papers upon insanity after surgical operations and fevers, and records a number of cases. There does not seem to be much in these papers necessary to comment upon, except that the idea is brought forward by several of the writers that the insanity is really septic. Dr. Theodore B. Hausen says "it is scarcely an exaggeration to say that if in the first week of the puerperium a psychosis in the form of an acute confusional insanity with hallucinations appears, without the occurrence of another non-puerperal acute infectious disease, and without preceding eclampsia, one can be sure puerperal infection is present, even when fever and other physical symptoms are not discoverable by a thorough examination." Clouston also seems to be in favor of the septic theory; and Olshausen divided puerperal psychoses into: 1, those after septic conditions, the infection-psychoses; 2, those after post-partum hemorrhage and during lactation, the exhaustion-psychoses; 3, those following eclampsia, when there is uræmia or some other impurity of blood, the intoxication-psychoses.

The differences of opinion in regard to the question of confusional insanity which are shown in the abstracts just given, and which certainly exist among alienists, seem to me to be largely due to the failure on the part of many to apprehend certain thoughts and generalizations. It is plain that in septicæmia there may be a delirium which may simulate a form or stage of confusional insanity, although it is not dependent upon any disease of the brain cortex, but is due to the direct action of the poison or poisons in the blood upon the cerebral nerve-cells. What is true of septicæmia is undoubtedly true also of uræmia. As septicæmia and uræmia frequently occur during the puerperium, puerperal septic and uræmic deliriums are far from rare phenomena.

Further, the cases which I have abstracted from the article of Dr. Mills prove definitely that there is such a thing as septic peri-encephalitis; so that it cannot be gainsaid that after childbirth either septic delirium or septic peri-encephalitis may occur, and may very well be spoken of as puerperal mania.

Cases of the characters just spoken of constitute evidently the infection-psychoses and the intoxication-psychoses of Olshausen. Their existence in no way disproves the occurrence during the puerperal state of true confusional insanity. I suppose the exhaustion-psychoses of Olshausen include cases of the latter character; but it would be a mistake to suppose that the puerperal confusional insanity must necessarily be preceded by any apparent great exhaustion or by any violent extraordinary cause of exhaustion like a post-partum hemorrhage. The emotional and physical disturbances of childbirth may well produce a confusional insanity, since they are in many cases incomparably more severe than minor operations, such as excision of the breast or the sewing-up of a ruptured perineum, which are occasionally followed by mental disease.

Moreover, although the condition of the brain-cells which underlies confusional insanity may be produced by other than toxic causes, it seems to me indisputable that it may also be produced by toxic disturbances of nutrition. This is well seen in delirium tremens, a disorder which is getting more and more to be recognized as a variety of confusional insanity. The mental disturbance of delirium tremens cannot be due to a direct action of alcohol in the blood or in the nerve-tissues at the time of the breaking-out of the disease. The "horrors" of the drunkard is the beginning of delirium tremens, and if the cerebral manifestations of the horrors or of the delirium tremens were due to a direct action of the alcohol, then they should be intensified, not relieved, by further doses of the poison. Evidently the symptoms are the result of nutritive changes in the ganglionic protoplasm which have been produced by the poison. In other words, the symptoms are only indirectly caused by alcohol. As acts alcohol, so in all probability may septic poisons act; as there is an alcoholic delirium and also a confusional mania which we call alcoholic, because it is indirectly caused by alcohol, so also are there in all probability a septic delirium and a confusional mania which is the secondary result of septic disturbance of nutrition.

The variations that occur in the symptoms of confusional insanity are certainly great, but does not almost every disease vary symptomatically? I suppose every practitioner of medicine has followed cases to the end in which after recovery he has been at a loss to say whether he had or had not to deal with such a comparatively simple affection as typhoid fever. Considering the complexity of the brain, the symptomatic variations in confusional insanity are not greater than are those of typhoid fever. More than this, owing to the fact that exaltation and depression of the cerebral cortex produce such similar symptoms, some cases of confusional insanity can scarcely be distinguished clinically (without the history of their whole course) from acute peri-encephalitis, and yet post-mortem examination shows that the lesion of the brain is essentially diverse. As proof of this fact I append the history, with autopsy, of a case in which the insanity followed the operation for laceration of the perineum, a case in which there were no symptoms of septicæmia at any time, a case in which the perineum had completely healed before the mental aberration became pronounced, and many days before the first febrile symptom was manifest, a case in which the autopsy proved the absence of any inflammatory lesions of the cortex. The contrast of this case with the one previously reported in this paper is sufficient to show how two cases of brain-disease closely resembling one another may have entirely diverse lesions.

Mrs. M. K., aged fifty-five years, widow, with one child living. Operated upon by Dr. Goodell for laceration of the perineum, December 2, 1892. Operation required about one hour, but the temperature during the following days did not rise above 99.6°. Ten days after the operation she voided urine naturally for the first time. The bowels were costive, but there were no other complications, and the mental condition of the patient appeared to be normal, though she seemed a little quiet. Twelve days after the operation it was noticed that the mental condition was changing, the patient becoming morose and refusing to take food. During the next five days her mental condition became more decidedly affected; she became suspicious, believing that the nurse and the patients in the ward were plotting to injure her son and to interfere with her own money affairs; even her son could not pacify her, and at times she appeared not to recognize him. She progressively became more and more disturbed, getting out of bed, insisting on walking around the ward, not recognizing where she was, moaning and wringing her hands, and at times talking rapidly and incoherently. Her temperature during the last five days before she came under my care, on the twenty-first day after the operation, varied from 98° in the morning to 99° in the evening; the pulse from 72 to 92; the respiration was steady at about 20; the sleep was much broken, and the patient very frequently got out of bed at night; the bowels were constipated, but were kept open with Rochelle salt.

The abstract of notes taken after her transference to my ward is as follows:

Twenty-second day after the operation. Very noisy last night, had to be removed from the ward. Her speech is now incoherent most of the time; she talks incessantly, and when she can be understood it is concerning some one persecuting her son. When aroused actively she answers questions rationally, but immediately rambles off into a confused babble. She is very restless, tries to get out of bed whenever she is left alone, but has brief snatches of sleep at intervals. Urine scanty, darker in color than normal; specific gravity 1025; slight trace of albumin, no casts.

Twenty-third day. Under anodyne patient slept quietly most of the night. The treatment is nourishment by liquid food as much as she can be made to take, but she fights and refuses to take food. Hyoscine, gr. $\frac{1}{50}$; morphine, gr. $\frac{1}{6}$; chloral, gr. 10, every eight hours.

Twenty-fourth day. Patient about in the same condition; under the narcotics, which have been varied *pro re nata*, she has been quiet. She has taken large quantities of milk and eggs, with stimulants.

Twenty-fifth day. Patient in the early part of the day very restless, but slept quietly for several hours after a hypodermic injection of hyoscine and morphine; then passed into a semi-comatose condition. During the day she was quiet except when aroused by feeding or other procedure, when she showed some signs of irritation; no paralysis, no disorder of the pupils, no stiffness of the muscles of the neck, and no evidence of local brain irritation; as the day progressed the stupor deepened. Food was taken better, and apparently digested very well. The mucous membrane of the mouth became very dry, the tongue fissured and was heavily coated, the breath very offensive. Urine passed involuntarily. When left to herself was absolutely quiet, but when disturbed would groan and toss about.

Twenty-sixth day. Mental condition about the same. Urine examined: specific gravity 1025, contained pus, albumin, and casts, hyaline and pale granular. Digitalis and stimulants were used freely. Toward night a decided change took place; the respiration became frequent, the face very pale, and the coma more marked.

Twenty-seventh day. Condition about the same. Repeated careful examination of lungs failed to detect any physical signs of pneumonia.

Heart-sounds normal. At times she is quite restless, tossing her head from side to side, flexing her legs, etc.

From this time until death, which occurred on the twenty-ninth day, the pulse gradually failed, and toward the last the whole surface of the body became cyanosed. Digitalis and strychnine were given hypodermically, liquid food and whiskey freely.

With much difficulty an autopsy was procured. On opening the skull there appeared to be some excess of blood in the sinuses, but there were no gross lesions either in the brain membranes or the brain-substance. The brain was put in Müller's fluid, and after hardening was given to Professor John Guitéras, who reported upon it as follows: "Sections for histological examination were cut from the frontal lobes, the transverse convolutions, and the occipital lobe. The result of this examination is negative. A number of sections from the several areas is submitted. They represent fairly well healthy brain-tissue. The methods of staining employed were ammonia-carmine, gentian-violet, hæmatoxylin, and eosin, and Weigert's myeline stain."

Unfortunately, in the case just reported no bacterial cultures were made, and, in so far, the record is imperfect. The history of the case, however, makes it highly improbable that there was any bacterial poisoning. The symptoms during life were those of confusional insanity, and in that coincided entirely with the etiological history. It is also unfortunate that a portion of the brain was not hardened in osmic acid, as possibly some lesions of the ganglionic cells might in this way have been made out. Nevertheless, the record is sufficiently complete to show that there was no peri-encephalitis and that there was no lesion in that brain discoverable by the ordinary methods of investigation. The case was evidently one of confusional insanity.

In attempting to sum up the result of our expiscation of acute delirium it becomes apparent that the deductions to be drawn are of two kinds: first, those which appear to be certainties; second, those which appear to be probabilities. The conclusions which seem to be established are: That cases of the so-called "acute delirium" are of various characters, representing several different diseases; that leaving out of sight septic, uræmic, and other intoxications, cases of which have undoubtedly in the past been recorded as acute delirium, there are two distinct diseases described as acute delirium—first, *acute peri-encephalitis;* second, an acute affection, probably primarily centred in the ganglionic cells, but without lesions that can be demonstrated by our present process.

Of the *acute peri-encephalitis* there are, again, several forms: one especially due to the presence of septic organisms in the brain itself, and therefore to be designated as acute *septic peri-encephalitis;* one in which there are no organisms, in which the cause appears to be emotional strain or other functional excitement, and which may therefore be known as acute *idiopathic peri-encephalitis.* If the observations of Rasori be correct, there must be a third peri-encephalitis, due to the presence of a special organism, and therefore worthy of rank among the peculiar fevers or germ diseases.

The conclusions which are to mind probably, but not firmly, established are, that all manias of an acute type which are not intoxication-neuroses and are not due to the presence of organisms in the blood, are divisible into two affections: first, mania proper; second, confusional insanity, and that each of these diseases becomes, when in its most severe form, an acute delirium. Thus, there would be, first, *acute mania* —that is, mild acute peri-encephalitis, known when in its severest form as *acute delirium*—that is, violent, usually fatal, peri-encephalitis; second, *confusional insanity*, without demonstrable lesion, but probably the result of changes in the ganglionic cells themselves, constituting in its severest form an *acute delirium*, also without demonstrable lesion, but, in fact, due to an exaggeration of the unknown ganglionic or other alteration present in the confusional insanity.

UNIVERSITY OF PENNSYLVANIA, February, 1895.

A CASE OF MIDDLE MENINGEAL HEMORRHAGE. OPERATION; RECOVERY.

AN ANALYSIS OF FORTY-EIGHT CASES OF UNCOMPLICATED INTRA-CRANIAL HEMORRHAGE.

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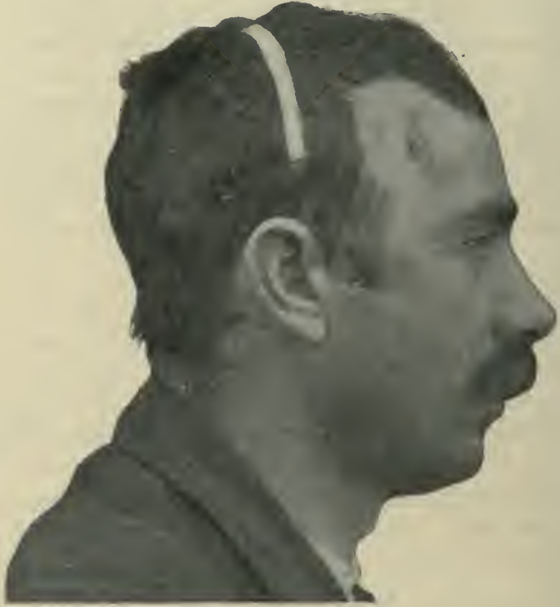
I.

THE patient, a man, was brought to the Massachusetts General Hospital December 27, 1892. Examination found œdema of the right temporal region. Unconsciousness present. An interval of consciousness was absent. Slight bulging of the right eye. (See Case XXIII. of the Extra-dural Group.)

Operation in the right temporal region. A skin-flap was made over the fracture and œdematous area. A fracture was detected running from about the middle of the temporal ridge an inch back of the coronal suture outward and forward across the squamous part of the temporal bone to a half-inch behind the pterion.

The bone anteriorly to the fracture was depressed. The trephine was applied over the depressed portion behind the coronal suture. Upon exposing the dura no pulsation was seen. The dura was dark in color. A slight amount of extra-dural blood escaped. On following the fracture down to the base of the skull the dura was found lacerated, the anterior branch of the middle meningeal artery torn, and blood-clot and lacerated brain-tissue present. The anterior branch of the middle meningeal artery was tied and the hemorrhage ceased. The blood-clots were removed, the exposed area cleansed with boiled water, and gauze drainage introduced. All the gauze was removed in four days. No unusual symptoms attended convalescence. Recovery was complete in three months. (See Fig. 1.)

FIG. 1.



This case is of interest because no fracture was detected before the operation, and it was supposed that the bulging of the eye indicated an increase of intra-cranial pressure, which proved true.

The method of operating was comparatively simple, in that the fracture was followed down until the bleeding vessel was found. This necessitated the free removal of bone below the trephine-opening.

There was no interval of consciousness in this case, and the conditions found easily explained its absence. The man was suffering from concussion and laceration of the brain as well as from intra-cranial pressure, and the interval of consciousness was obscured by the presence of the concussion. The recognition of an interval of consciousness, as will be seen by the analysis of the following cases, is of very great importance. If, however, the interval of consciousness is not present, as in the case reported, intra-cranial pressure from hemorrhage cannot be said to be absent, for concussion attendant upon the injury may mask the interval of consciousness which might have been present had the injury been less severe.

In this paper an attempt has been made to present for consideration in a concisely accurate form the subject of intra-cranial hemorrhage. The material upon which this study is based has been collected from French, German, and English medical literature covering the period from 1886 (the date of Jacobson's[1] exhaustive study) to September, 1894. Several cases of intra-cranial hemorrhage are here recorded for the first time, occurring at the Massachusetts General Hospital, including the case recorded above, which came under the immediate care of one of the writers, and was the direct stimulus to the present investigation.

It may with truth be said that intra-cranial hemorrhage due to traumatism and all "injuries of the head affecting the brain are difficult of distinction, doubtful in their character, treacherous in their course, and, for the most part," were formerly "fatal in their results."

To-day, because of a keener interpretation of the nervous symptoms and a knowledge of their localizing significance, because of aseptic methods of operating, and because of the improvement in operative technique, the mortality following intra-cranial hemorrhage is noticeably diminishing.

The importance of this subject is very great. This is shown by the frequency with which cases of this class are overlooked, by the slightness of the violence which produces so fatal an accident, by the suddenness with which death often occurs, and by the very great difficulty of differentiating between symptoms of the lesion under discussion and laceration, and concussion of the brain.

In approaching a case of head-injury the history of the case, including the story of the original violence, is of value. Many head-injuries, which at the time seem simple and unimportant, may prove serious, and may produce ultimately fatal results, as in Cases IX. and III. of Group A, and Cases V. and XXI. of Group B, in which cases the hemorrhage was caused by a blow from a whip-handle, a fall down a few steps, a penknife-wound, and a blow from a billiard cue respectively.

Other cases occur in which the injury is pretty considerable and definitely localized, as in Group A, Cases V. and XV., in which the violence was from the kick of a horse and a blow from a crowbar.

More often the violence is due to falls, and usually to pretty serious falls, as in Group A, Cases XVIII., XX., XXI., and Group B, Case XIX., which were falls down a flight of stairs, or from the top of a freight car, or from one story of a house.

In this series of operated cases there were 27 of extra-dural hemorrhage.

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[1] Guy's Hospital Reports, vol. xliii., 1886.

The nature of the injury in these cases:

	Cases.
Falls	18
Blows	4
A pistol-wound	1
Unknown	1
Kicked by a horse	2
Blow with a cricket-ball	1

There were found to be 21 cases of sub-dural hemorrhage.

The nature of the injury in these cases:

	Cases.
Stab-wounds of head	2
Falls, striking on head	11
Blows on head	7
Unknown	1

The sources of intra-cranial hemorrhage which are of practical importance to the surgeon are:

1. From the middle meningeal artery and its branches;
2. From the veins of the pia mater;
3. From the sinuses of the brain;
4. From lacerated brain-tissue.

These four sources of traumatic intra-cranial hemorrhage cannot be easily differentiated clinically. The difficulty of distinguishing hemorrhage from any one of the sources from the associated laceration and concussion of the brain is at times extremely great.

The only very important *general* symptom of intra-cranial hemorrhage, excepting shock, is the interval of consciousness. An interval of consciousness often exists between the time of the injury or stunning of the patient by the accident and the onset of the symptom of compression due to the intra-cranial hemorrhage.

This interval of consciousness is not always present, and it may not be well marked.

In 21 cases of sub-dural hemorrhage here reported the interval of consciousness was present in 9 cases. Its presence was unrecorded in 1 case, and it was absent in 11 cases.

In 27 cases of extra-dural hemorrhage the interval of consciousness was present in 14 cases and absent in 13 cases.

In the sub-dural group the interval of consciousness existed in the following cases: II., IV., VIII., IX., XIII., XVI., XVII., XVIII., and XIX., and a detailed account is here given of these symptoms in each instance.

In Case II., two months after the fall, paraplegia and left hemiplegia appeared, and ten days later coma came on rapidly. In this instance the interval of lucidity was an extreme one and was an important factor in the diagnosis of the lesion. It would be interesting to know the pathological condition present which was the occasion of the hemorrhage at so late a date.

In Case IV. there was present a stupid, drowsy condition, which later (after seven days) became unconsciousness. This is not unusual. In place of an interval of clear mental activity drowsiness may precede the coma of great intra-cranial pressure. This should awaken alarm.

Case VIII. illustrates the typical interval of consciousness following a head-injury. A blow on the head; unconsciousness temporary; walks a good distance; becomes stupid or drowsy, and forty-eight hours after the receipt of the injury is semi-conscious; seventy-two hours after the injury is comatose.

Case IX. After a fall, which was forgotten; on the following day was drowsy; drowsiness continued; on the sixth day coma.

Case XIII. was stunned, but recovered consciousness almost immediately. On the third day after the accident delirium appeared followed by unconsciousness on the fourth day.

Case XVI. The interval of consciousness in this case was not well marked, although present; that is, after an injury unconsciousness existed, and ten hours after the accident the patient became partially conscious. It seems for all practical purposes that the presence of consciousness is relative, but it would be better, perhaps, for purposes of classification to make the distinction a perfectly clear and definite one; either the person is wholly conscious or is unconscious.

Case XVII. At first stupid and dull. This dulness increased up to thirty-six hours after the accident, then for two days there was improvement. He was discharged home, against the advice of his physician, and was returned in four hours comatose.

Case XVIII. An interval of three weeks of consciousness, followed by sudden unconsciousness and associated with general convulsions.

Case XIX. fell; walked home; later there was unconsciousness in varying degree through several days, which, because of its increase, indicated operation.

In the extra-dural group an interval of consciousness existed in the cases numbered III., IV., V., VIII., IX., X., XIV., XV., XVI., XVII., XIX., XX., XXI., and XXVII. In Cases XIX. and XX. the interval of consciousness was only partial. Reference may be had to the individual cases for an account of the symptoms in the extra-dural group.

Taking the two groups together, in the 48 cases of extra and subdural hemorrhage, 23 presented an interval of consciousness—that is, nearly one-half of all the cases.

Obviously there must be a large group in which the interval is never present, the concussion caused by the accident passing over into the coma of compression.

The duration of the interval of consciousness may vary from a few minutes to several weeks, as illustrated in the following two cases.

Case XVII., extra-dural group. The patient fell into the water, striking his head on a pile. He walked toward home, and in twenty minutes fell unconscious in a convulsion; spasms began on the left side of the body and appeared later on the right side. There was a scalp wound one and a half inches above the left mastoid process. The bone was not fractured. The breathing was labored. Pulse was about 60. Bleeding from the right nostril. Trephined one and a half inches behind the external angular process of the frontal bone on the right side. Four to six ounces of blood were removed and recovery was complete.

Case II., sub-dural group. A fall; two months later paraplegia followed by left hemiplegia. Ten days later tongue turned to the right. Thickness of speech, involuntary micturition, coma. Trephined over the right fissure of Rolando. Sub-dural clot found. Gradual and complete recovery.

The duration of the interval of consciousness depends on the number and the size of the vessels bleeding and the rapidity of the hemorrhage. If the patient is kept quiet and no stimulants are given, the hemorrhage will be less severe than if the patient is allowed to move about and freely stimulated.

Case XVII. of the sub-dural group illustrates very well the harm which may come from the patient's moving about. A man knocked down in the street was conscious but dull. At the end of thirty-six hours the stupor increased, but during the next two days the improvement in his mental condition was so great, and there being no localizing symptoms, operation was thought inadvisable. The man left the hospital against advice, and was returned four hours later restless and delirious. There were convulsions of the left arm, head was thrown back, right arm was rigid, respiration was labored and thirty to the minute; right pupil dilated, left contracted. Complete unconsciousness soon appeared, followed by coma and death four days later. [The autopsy is reported with the details of the case.] There can be very little doubt that the moving of this man to his home was the immediate cause of starting up fresh hemorrhage.

It may be impossible to detect the interval of unconsciousness because of the drunkenness of the patient.

Jacobson concludes that the interval of lucidity is absent in one-third of the cases.

Hutchinson says: "It would seem that it is not usual for a large hemorrhage to occur at the time of the injury, for almost always there is an interval during which the patient is well before the symptoms of compression come on."

The interval of consciousness being the only general distinctive symptom of intra-cranial hemorrhage, it is necessary next to inquire as to the local symptoms—and one must consider the condition of the limbs as to hemiplegia, paraplegia, and rigidity; the condition of the pupils, whether they react to light and accommodation, and whether they remain of equal size; the character of the pulse; the character of the respiration; the condition of the scalp; whether, if uuconsciousness is present it increases and passes into coma.

In the 48 cases on which this paper is based nervous symptoms were absent in only 5 cases. The variety of cerebral symptoms noted was aphasia, paralysis of one arm, paresis of one leg, paraplegia, spasms of the face and leg, turning of the eyes, spasm of the sterno-mastoid muscle, anæsthesia of different parts, rigidity, general convulsions, ankle-clonus, hemiplegia.

These cerebral symptoms may be well marked; they may be but little noticed—that is, temporary; certain of them may be more marked in one limb than in the other, or entirely absent.

The condition of the pupils. Nothing new was gained by a study of the pupils in these cases. Jacobson's observations were confirmed. If the pupils are natural as regards reacting to light, the compression of the brain is probably in a recoverable condition if trephining is immediately performed. If the pupils are insensitive and often at the same time dilated, the compression is probably extreme; and while trephining is demanded, it is improbable that the brain in these cases will recover itself after removal of the clot.

The Hutchinson-pupil is of the greatest importance. By this is meant a widely dilated pupil on the side of the injury—*i. e.*, opposite the paralyzed side, the other being natural or contracted. This sign, taken in connection with other evidence, is of supreme value. It indicates pressure on the third cranial nerve, and locates the pressure in the middle fossa.

The pulse. In cases of well-marked compression, uncomplicated, the pulse will be slower than normal and full. In cases of doubtful diagnosis it is important to record the pulse at frequent intervals—*i. e.*, hourly or half-hourly, that any variation may be quickly noted.

Unconsciousness: coma. Where the hemorrhage is rapid and the compression great the coma may be very deep at the outset. The degree and course of the unconsciousness are of importance, for a distinguishing sign of hemorrhage from one of the sinuses is the sudden coma, the pressure being severe. One of Dr. Elliot's cases here tabulated illustrates this point well. The beginning coma must not be taken for a natural sleep.

Respiration. In this group of cases in only nineteen out of forty-eight is there a record of stertorous breathing. The character of the breathing is more often omitted than recorded in the reports of cases. The Cheyne-Stokes breathing is noted in a few cases.

The condition of the scalp and cranial bones. Every patient suffering from so severe a head-injury as to make it probable that trephining is likely to be done should have the head shaved of all hair. This will expose the scalp to good view. Ecchymosis and a feeling of contusion in the scalp—puffy swelling—will suggest an underlying fracture. A progressive intra-cranial hemorrhage may force its way through a fracture in the skull and give rise to a hæmatoma under the scalp.

In a given case of head-injury, having had no regard for the signs above mentioned, there may exist doubt as to the presence or absence of laceration of brain-tissue. The following facts may aid in a definite diagnosis: In middle meningeal hemorrhage the scalp-wound or bruise is usually over the course of the artery. The violence leading to middle meningeal or other hemorrhage may be very slight, as in certain cases already mentioned. An injury causing brain laceration will almost always be severe. If the concussion is severe, the interval of consciousness is apt to be absent. Where the brain is lacerated there are usually present twitchings and spasms of certain groups of muscles.

The treatment is, of course, in these cases trephining and the removal of sufficient bone to enable one to evacuate the blood-clot and arrest the hemorrhage.

If there is fracture present, the trephining should be in the line or fracture. If there be no fracture, the trephining should be, it seems to the writers, according to the rule of Voyt and Beck, at a point one and one-half inches behind the external angular process of the frontal bone, and one and one-half inches above the zygoma, which will locate the anterior branch of the middle meningeal.

Krönlein suggests the advisability of trephining twice, the first point being that suggested by Beck, the second point in Beck's horizontal line below the parietal eminence.

The size of the trephine-opening is determined by the demands of the case. A large trephine will not cut evenly through the bone on account of the curvature of the skull. It is best to use a small inch or inch and a half trephine and enlarge the opening with the rongeur forceps. Whether the dura shall be opened or not is to be decided in each instance on the general principle that it adds little to the risk of the patient, and, if unopened, much valuable information may be lost. The fact should be kept in mind that only in tumors of the brain are there liable to be herniæ cerebri after trephining. Strict asepsis should be maintained, and all the time taken that is absolutely necessary to an aseptic and thorough operation. In children a rapid operation is demanded.

The indications for immediate operation after the reception of an injury to the head are increasing paralysis, thickness of speech, persistent convulsions, an increase in any or all pressure-symptoms—*i. e.*, increasing unconsciousness—the Hutchinson-pupil being an important sign of increasing intra-cranial pressure.

Aphasia points to an involvement of Broca's convolution. Disorders of sight and hearing point to an extension toward the occipital and temporal lobes respectively. Paralysis of the third nerve points to an extension toward the base of the skull.

The mortality after operations on the head for intra-cranial hemorrhage other than cerebral hemorrhage proper has not been determined since 1886.

Jacobson in the cases studied previously to 1886 found that out of 70 cases of extra-dural hemorrhage 13 cases recovered from the operation, a percentage mortality of 81.43, and a percentage recovery of 18.57.

The group of cases here reported enables a fairly just estimate to be formed of the mortality to-day. Since 1886, then, of the 26 operated cases of extra-dural hemorrhage, 18 cases have recovered and 8 have died, a percentage mortality of but 30.77, and a percentage of recovery of 69.23. Of the sub-dural group of 19 operated cases, 15 cases recovered and 4 cases died, showing a mortality of 21.06 per cent. and recovery of 78.94 per cent.

In estimating the value of these figures it must be borne in mind that this is a group of selected cases; many cases have been operated probably which have died and have remained unreported. There must be a very few, on the other hand, which have been operated and recovered, and have been also unreported. These figures represent the mortality and recovery rates of only operated cases—that is, cases in which there have appeared sooner or later definite indications for interference. Of course, of the many unrecovered and unoperated cases there must have been many in which to-day there would have been discovered definite indications for operation. But after taking into consideration just what this group of cases is (here represented) the mortality is indeed low, and the percentage of recoveries is very encouraging for operative interference even in pretty doubtful and desperate cases of severe head-injury.

SURGICAL ANATOMY OF THE MIDDLE MENINGEAL ARTERY.

Steiner[1] has examined one hundred skulls with reference to this subject, with the following results:

In 57 cases the division of the artery into its anterior and posterior branches took place within the foramen spinosum, so that there was no main trunk of the artery within the skull.

In 35 of the remaining 43 cases the length of the main trunk within the skull was from 1 to 3½ cm. In the remaining 8 cases the length was 3½ to 5 cm.

In 38 cases the course of the anterior branch for a distance of 1 to 3 cm. along the anterior inferior angle of the parietal bone ran through a bony canal—*i. e.*, the vessel was completely surrounded by bone, so that it must necessarily be cut off by the crown of a trephine cutting through the bone at this point.

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[1] Archiv für klin. Chir., 48 I. 101.

In 6 cases the anastomosis of the anterior branch with the ophthalmic artery, through the sphenoidal fissure, was so free as to constitute the true origin of the middle meningeal, so that either the posterior branch alone or even no vessel whatever entered the skull through the foramen spinosum, which in these cases may be entirely wanting.

A careful trial of the three recognized methods for locating the anterior branch for purposes of trephining was made with the following results:

Vogt's method locates the artery at the intersection of a vertical line drawn a thumb's breadth back of the frontal process of the malar bone and a horizontal line drawn two-fingers' breadth above the zygoma.

By this method the artery was exactly located in 43 per cent. of the cases. In the majority of the remaining 57 cases the point where these lines crossed lay behind the line of the artery. The point found by this method will vary with the thickness of the thumb and fingers of the operator, as is obvious.

Witherle's method locates the vessel at a point 1½ inches behind the frontal bone, and either one inch above the zygoma or 1½ inches above the articular process of the lower jaw.

By measuring from the upper border of the zygoma Steiner found that by this method he came upon the trunk of the artery in only 28 cases, and that in 65 of the remaining 72 cases the point so located lay from 1 to 2½ cm. behind the actual position of the artery.

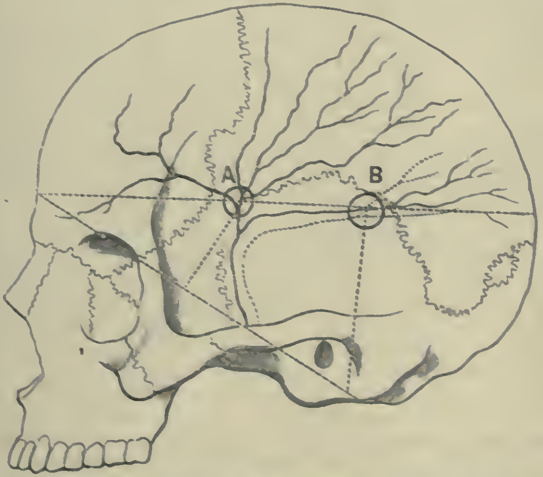
Krönlein's method locates the anterior and posterior branches by first drawing a base-line through the lower margin of the orbit and the external auditory meatus. The anterior and posterior branches are both located on a line drawn parallel to this through the superior margin of the orbit, the first at a point 3 to 4 cm. behind the external angular process of the frontal bone, and the second at the intersection of a line drawn vertically from the posterior border of the mastoid process. By this method the anterior branch was located in 53 per cent. of the cases. In most of the remaining cases the artery lay in front of the point located. The anterior branch, or a large secondary branch, was located by this method in only 40 per cent. of the cases. Of these methods, that of Krönlein is certainly the best, since, admitting that an error of 1½ cm. is of no practical importance, the anterior branch will be located with sufficient accuracy in 70 per cent. of the cases.

With reference to the anterior branch, all these methods have the disadvantage of locating the trephine-opening so low as to fall below the course of the artery in all the cases where it takes its origin from the ophthalmic, and accordingly comes in close relation with the outer side of the skull at a somewhat higher point. A second disadvantage is that the artery is found by these methods at the point where it lies in a bony canal (as was found in 38 of the 100 cases), and is consequently liable to be cut off by the trephine.

A disadvantage of Krönlein's method for finding the posterior branch is that the trephine is applied in close relation to the transverse sinus. To obviate these disadvantages the writer suggests that the horizontal line be drawn at a somewhat higher level—namely, from the middle of the glabella.

For finding the anterior branch a line is drawn from the glabella to the tip of the mastoid process, and a perpendicular erected at its centre. The intersection of this perpendicular with the horizontal line will give the point for finding the anterior branch.

FIG. 2.



Method of locating the trephine-opening for finding the branches of the middle meningea artery. (After STEINER.) A. Point for anterior branch. B. Point for posterior branch.

The posterior branch is found at the intersection of the horizontal line and a perpendicular drawn just *in front* of the mastoid process. The author claims to have located the anterior branch in 90 per cent.

By this method it is obvious that the trephine-opening for the posterior branch is placed slightly above and in front of the point given by Krönlein's method, and therefore further from the lateral sinus.

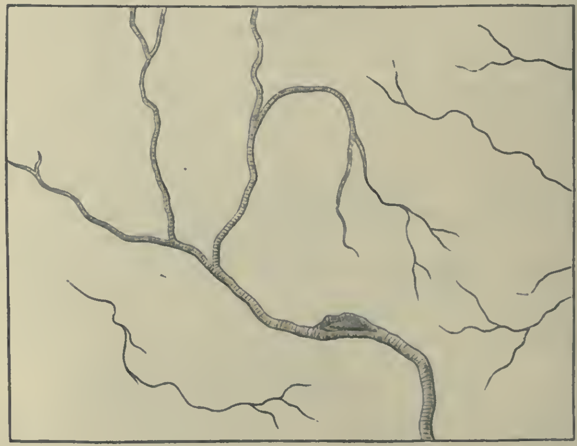
The writer goes on to state that exact methods of locating the artery are unnecessary in cases where it is possible to remove a flap of skin, muscle, and bone from the side of the skull, with knife and chisel, so as to expose the main trunk and both branches at the same time, either for tying the arteries or removing extravasated blood.

This method of osteoplastic resection is of course inapplicable (*a*) when the soft parts have been torn from the bone by the original injury, or extensively lifted from it by extravasated blood; (*b*) when compound fracture is present. In these classes of cases the exact methods of locating the artery will still be useful.

This method of osteoplastic resection, recommended first by Krause for gaining access to the Gasserian ganglion, was also suggested by him as applicable to injuries of the middle meningeal artery, which is exposed during the greater part of its course.

The flap is described by Krause as follows: "The base of the flap lies above the zygoma just in front of the tragus; the line then runs upward, curving backward at the same time; then describes a semicircle forward and returns to the zygoma, so that the base of the uterus-shaped flap is 3¼ cm., height 6½ cm., and its greatest width at the upper part 5½ cm." The writer recommends a similar-shaped but slightly larger flap, the width and height of which are each about 6 cm., and the width at the base from a thumb's breadth back of the margin of the orbit to the tragus. Near the anterior border of this opening the anterior branch of the artery will be found, and near the posterior border the posterior branch, and easy and free access will be gained to all hæmatomata in the temporal region. If the artery shall be found to have been ruptured still nearer the foramen spinosum, access to it can be gained by chiselling through to the zygoma and breaking off the lowest portion of the lateral wall of the skull. This method is said to have been successfully adopted by Professor Wolfler in two cases.

FIG. 3.



Ruptured middle meningeal artery. The seat of rupture shows a hair lying in the artery. (Case, Warren Museum, Harvard Medical School, No. 7801.)

The following case and pathological specimen, illustrated in Fig. 3, is extremely valuable as demonstrating a local lesion in the middle meningeal artery beneath a fissured fracture of the skull.

A young man was standing on the sidewalk, and was struck in the head by a brick. He fell, striking the sidewalk; recovered in a few minutes and was able to walk to the house of a friend, where symptoms of compression came on, and he died shortly afterward.

At the autopsy made by the medical examiner, Dr. F. A. Harris, of Boston, there was found a slight linear fracture of the skull crossing the course of the middle meningeal artery, which was ruptured. An extensive extravasation of blood had taken place between the dura and the skull. The convolutions were markedly flattened. The specimen is No. 7801 of the collection in the Warren Museum, Harvard Medical School. (See drawing, Fig. 3.)

GROUP OF EXTRA-DURAL HEMORRHAGE CASES.

CASE I. (Krönlein, *Deutsche Zeitschr. für Chirurgie*, 1886.)—A man, thirty years old, fell from a step while drunk, and was unconscious from the time of the injury. Aphasia. Left facial paresis and ocular spasm. Motor paralysis of the right leg and arm. Could be partially roused. Pupils contracted but react. Pulse 120, of medium strength. Respiration 28 to 30, superficial. Slight excoriation of skin in the left temporal region. On the eighth day stupor increased to coma, and right facial paralysis appeared.

Trephined on the left side over the anterior branch on supra-orbital level, 4 cm. behind external angular process of the frontal bone, and later, over the posterior branch of the middle meningeal. Hæmatoma, 240 grammes, filled the middle fossa and the posterior fossa as far as the occipital protuberance. A fissure was found running vertically downward in the temporal region, cutting off the main trunk of the middle meningeal artery. Answered questions in two days, and paralysis disappeared in three days. Recovery.

CASE II. (Krönlein, *Deutsche Zeitschr. für Chirurgie*, 1886.)—A man, aged forty years, fell down some steps, and was unconscious from the time of injury. Moved when loudly spoken to. Three days later pulse 74; less movement of the left arm and leg on needle-puncture than of right arm and leg. Aphasia. Left abducens oculi paresis and nystagmus. Boggy area over right ear and slight tenderness on slight pressure over this same region. On the fifth day was still unconscious and the pulse was 120.

Trephined over the anterior division of the right middle meningeal. Dura punctured. No hæmatoma found. Death in twenty-four hours.

Autopsy. Fracture of the right temporal bone and parieto-occipital hæmatoma reaching forward within 3 cm. of the trephine-opening. A trephine over the posterior branch of the middle meningeal would have exposed this clot.

CASE III. (Brunner, *Correspond. für Schweizer Aerzte*, June, 1888.)—A man, aged thirty years, fell from steps and was conscious for four or five hours; later, unconscious. Moved the left leg occasionally. Pulse 50 to 60, full and strong, but intermittent. Respiration stertorous, Cheyne-Stokes. Ecchymosis of the left eyelid. Both pupils were dilated and reacted but weakly. Right facial paresis. Œdema of the scalp in the left temporal region. Slight wound of scalp not reaching to bone. Right hemiparesis and hemianæsthesia.

Trephined over the anterior branch of the left middle meningeal. A fissured fracture running forward and including the groove for the middle meningeal artery was found, an extra-dural hæmatoma 3 cm. thick reaching forward to the frontal bone and toward the median line. Free bleeding from the posterior division and the anterior branch of the middle meningeal, which was checked by three catgut sutures. Hæmatoma, 200 grammes. Condition unchanged by operation. In twenty-four hours moved the right arm. Pulse 86 to 100. In forty-eight hours conscious, and moved right arm and leg. Died on the fifty-eighth day of pneumonia.

Autopsy showed a fracture of the base on the right side.

CASE IV. (Davies-Colley, *Lancet*, March 31, 1888.)—A man, aged fifty-three years, fell from a height of twelve feet and was stunned, but recovered consciousness, though remaining drowsy. There was paresis of the left arm. The pulse was slow and regular. A bruise was found in the right temporal region. On the eleventh day trephined over the right fissure of Rolando. A large extra-dural hæmatoma was removed. Recovery was complete.

CASE V. (Croft, *Lancet*, 1887.)—A woman, aged twenty-six years, was kicked in the head by a horse. There was an interval of consciousness which lasted several hours, when coma ensued. Twelve hours later there was still coma. Complete paralysis of the right arm and leg. A scalp-wound was found just below the left parietal eminence.

Trephined under this wound, and an extradural hæmatoma of two and a half ounces was removed, the hemorrhage being from the posterior branch of the middle meningeal. Moved the right arm and leg in six hours and spoke in two days. Recovered completely.

CASE VI. (Walker, *Medical and Surgical Reporter*, 1888.)—A man, aged thirty-five years, history not known. Stupor. Paresis of the left arm and leg and incontinence of urine. Pulse 40. Pupils reacted. On the second day the paresis had become complete and the unconsciousness had increased. On the fourth day the pulse was 38. There was feeble reaction of the pupils, unconsciousness still existed.

Trephined over the right fissure of Rolando. No fracture of the skull found. Extra-dural clot, four ounces. On the sixth day the patient had so far recovered consciousness as to be able to give the history of having fallen from a scaffold ten feet high. He worked three hours after the fall, walked part of the way home, and fell. Complete recovery in a month.

CASE VII. (Stokes, *British Medical Journal*, 1888.)—A man, aged fifty years, fell from a cart four days before. Insensibility present, which as far as could be ascertained came on immediately; continued upon examination. After four days stupor existed. There were found left brachial motor monoplegia and partial paralysis of the left facial nerve. Barely perceptible insufficiency of the left leg existed. There was a bruise over the upper part of the right fissure of Rolando. This condition of things persisted, and the ninth day the patient became comatose. Swallowed very poorly. Respiration became stertorous, 12, 14, 6 a minute.

Trephined over the bruise on the scalp. A clot was found at the anterior and inferior edge of the trephine-opening. A second opening was made immediately below and in front of the first and a thick clot removed. There was immediate relief, he asking for water, and swallowed it. He moved the left arm and leg while on the operating-table. Complete recovery.

CASE VIII. (Fröhlieh, *Münch. med. Wochenschr.*, 1888.)—A boy, aged seventeen years, received a blow on the left parietal region and walked to his home, some distance. In an hour and a half pain and delirium appeared, with vomiting. Stupor was present. He was found by his physician in a dying condition five hours afterward.

Autopsy. A bruise in the left parietal region. No fracture of the skull. Extra-dural hæmatoma from the supra-orbital ridge to the coronal suture. Hemorrhage from the branch of the middle meningeal. Dura was depressed 4 cm.

CASE IX. (Briggs, *Nashville Medical Journal*, xlix. 193.)—A man, aged fifty-one years, had received several blows from the handle of a whip, but walked home. A scalp-wound was found in the right temporo-parietal region. Complete coma in eight hours. Stertorous respiration. Pulse full. Left hemiplegia. Right pupil dilated and did not respond to light. Twenty-three hours later operation.

Trephined. Star-shaped fracture found. Extra-dural clot one inch thick and covering the entire right hemisphere was found. A little bleeding from the exposed small branch of the middle meningeal. Profuse venous bleeding from the right lateral sinuses checked by lateral pressure. Sponges held in place by pressure. Forceps left *in situ.* Patient's condition alarming. Pulse 110. Patient asked for tobacco and answered questions. Sponges removed on second day. Severe hemorrhage checked by gauze tampon. Recovery, with almost complete loss of vision in the right eye and paresis in the left arm.

CASE X. (Calder, *British Medical Journal*, 1889.)—A man, aged twenty-six years, fell down stairs; was unconscious, but recovered consciousness in seven hours. Slight pain behind right ear for five days, then became unconscious again. Sensation and motion of limbs normal. The right pupil a little larger than the left; both reacted. Ptosis of the right eyelid and strabismus of the right eye. Pulse slow, full, and regular. Just above the right ear was found a slight swelling under the skull. Pupils became dilated on sixth day. Pulse 48. Occasionally patient pointed to the swollen spot. On the seventh day unconsciousness deepened; coma at 5 P.M.

Trephined one and a half inches in front of the right ear. A clot was found forming, about an ounce of blood on the surface of the dura and adhering to it. In the evening the pulse rose to 80 and consciousness was completely restored. Ptosis and squint disappeared on the fourth day. Discharged in one month, well.

CASE XI. (Deaver, *Journal of Nervous and Mental Disease*, 1890.)—A man, aged twenty years, received a pistol-wound in the left temporal region. Conscious. No symptoms. Next day aphasia.

Trephined over the lower end of the left fissure of Rolando. Bullet imbedded in the skull and fracture of the inner table. No depression. Extradural clot. Hemorrhage from the posterior branch of the middle meningeal. Complete and quick recovery.

CASE XII. (Deaver, *Journal of Nervous and Mental Disease*, 1890.)—A man, aged thirty-four years, fell twenty feet down a hatchway. A scalp-wound over the right parietal eminence. Respiration 14, temperature 97°. Conscious, but a little dull. In an hour and a half restlessness, twitching of the right leg, arm, and face, respiration labored, then in half an hour convulsions of the right side, becoming rapidly general.

Trephined four hours later under the wound, but no fracture was found. Four ounces of extra-dural clot. Death from shock.

Autopsy. A fissured fracture of the left parietal bone, starting immediately below the trephine-opening and extending to the base of the skull.

CASE XIII. (Deaver, *Journal of Nervous and Mental Disease*, 1890.)—A man, aged twenty-three years, fell fifteen feet, striking on his head. Complete unconsciousness. Pupils reacted, respiration 24, and pulse 100. Scalp boggy over the whole of the left side and vertex. Partial consciousness returned in twenty minutes. Epileptiform convulsions, breathing embarrassed, pulse full and strong. Cyanosis. Respiration slow, deep, and stertorous. Pulse slow and full. Right side slightly spastic, left side paretic.

On raising the scalp there was found a fissured fracture on the left side following the coronal suture. Trephined over the lower end of the fissure of Rolando. Anterior branch of the middle meningeal ligated. Bleeding continued, and a ligature was placed on the posterior branch of the middle meningeal. Four hours after partly rational. Six hours after, pulse 96, respiration 28. Recovery complete. Two slight convulsions on the second day.

CASE XIV. (Ransohoff, *Annals of Surgery*, 1890.)—A man, aged twenty-eight years, a merchant, fell eight feet from a ladder. No unconsciousness and no symptoms. He went about his business. Eight days later headache and unconsciousness. In three hours stertorous respiration, pulse 40 and full. Coma. No conjunctival reflex. Twitching movements of the face and both sides of the body. No paralysis. Right pupil contracted, sluggish. Left pupil dilated unduly and fixed. No evidence of traumatism on head. Urine, specific gravity 1040 and contained sugar. Temperature 107°. Stertor and coma. Paresis.

Trephined over the left temporal bone two inches above the external angular process, and six ounces of extra-dural clot removed through the opening, 1 x 2 inches. All hemorrhage ceased on the removal of the clot. Pulse was

140, and collapse supervened. Next day consciousness returned. Hemorrhage on the ninth day; recurred on the tenth in spite of packing, and the source could not be found.

Ligation of the carotid artery, septic course of wound, and death on the fifteenth day from hemorrhage from carotid. Urine normal twelve hours after the operation.

CASE XV. (Ghent, *Gaillard's Med. Journal*, August, 1891.)—Blow from a crowbar over the right parietal bone. Unconscious for twenty minutes, then recovered and walked 300 yards. Conscious for five hours, and then unconscious. Pupils dilated, respiration heavy and stertorous. No movements on the left side. Fifth day unconscious, pulse 46, respiration slow, involuntary micturition and defecation.

Trephined over parietal bone in the wound. No fracture or depression. One and one-half ounces of extra-dural blood-clot removed. On rousing from chloroform spoke and recognized friends. Moved the left arm and leg on the day after operation. Recovery complete, though delayed by suppuration.

CASE XVI. (Redman, *Medical News*, 1891.)—Conscious for half an hour, climbed a fence and walked home, fifty yards. One and one-half hours later unconscious; pupils widely dilated, no reaction; pulse 120, wiry; respiration labored and becoming stertorous. Vomiting every few minutes. Involuntary micturition. Head held slightly to the left side. Twitching of the right arm and leg. Rhythmic clonic spasms of right arm. Scalp-wound on the right side, horseshoe-shaped and four inches long, its centre being about a quarter of an inch above the right eye. A fissured fracture of the frontal bone one and one-half inches long.

Trephined on the right side three hours after the injury; the inner table was found depressed. An extra-dural clot three inches in diameter removed. Patient could talk on coming out of chloroform. Catgut drainage. Rapid and complete recovery.

CASE XVII. (Stewart, *Edinburgh Medical Journal*, December, 1891.)—Fell into the water, striking his head on a pile. Walked toward home, and in twenty minutes fell unconscious in a convulsion. Spasms began on the left side of the body, and appeared later on the right side. A scalp-wound one and a half inches above the left mastoid process. Bone not fractured; breathing oppressed; pulse about 60, and slightly irregular; bleeding from the right nostril.

Trephined one and a half inches behind the external angular process of the zygoma on the right side. From four to six ounces of blood were removed. Dura mater flapped with each inspiration. Next morning the patient wanted to go to work. Recovery complete in three months. Interrupted in three weeks by a rise of temperature to 103.6°.

CASE XVIII. (McCosh, *New York Medical Record*, 1892.)—A boy, aged seven years, fell down stairs. Semi-comatose for twenty-four hours. On the third day stupor lessened. Legs drawn up; aphasia. On the sixth day paresis of the left upper extremity. On the seventh day paresis of the left leg and face. Convulsive movements on the left side, and finally complete hemiplegia.

On the eighth day trephined just in front of the right fissure of Rolando. Extra-dural clot found over the centre of the Rolandic fissure. Dura torn. Moved leg and arm on coming out of chloroform. Recovery complete, without convulsions.

CASE XIX. (J. W. Elliott, *International Medical Magazine*, 1893.)—A boy, sixteen years old, fell twelve feet. A small scalp-wound existed near the right parietal eminence. Stunned; regained partial consciousness; could be roused. Pulse 68, strong; respiration 20, and quiet. Hemorrhage from right ear. No paralysis, but slower response on the left side. Knee-jerk greater on the left side. In about two hours could not be roused. Pupils dilated, right more than left, and neither responded. Pulse 42; stertor, soon becoming coma. Respiration 28; pulse 40. The right pupil unduly dilated.

Operation. No depression. Trephined one-half inch above the zygoma over point of the right middle meningeal artery. Found a large extra-dural hæmatoma. Branch of the anterior division of the middle meningeal torn and bleeding. Opening enlarged upward and backward. Brain depressed one inch. Considerable hemorrhage from the dura checked by gauze tampon. Pulse 100; respiration slow and stertorous. Consciousness returned on the second day. Recovery complete in three months.

CASE XX. (Elliot, *Massachusetts General Hospital Records*, vol. cclxxvii. p. 82.)—A man, aged twenty-seven years, fell from a freight-car. Nine hours later semi-conscious; pulse 100, and weak; pupils were equal and reacted. Œdema over the right temporal region and a small wound of the occipital region. Twenty-four hours later unconsciousness complete; no movement of the legs. Fracture of the spine in the lower dorsal region discovered. Pulse 88. Œdema of scalp increased. In forty-eight hours cyanotic. Scalp tense and very œdematous.

Trephined over the upper part of the right parietal bone, and a fracture found. Fissure running forward and backward continuous with the coronal suture, which was split open. About three drachms of extra-dural clot and hemorrhage from the longitudinal sinus. Pulse rose to 150 and the cyanosis disappeared. Answered questions the evening of the operation. In twenty-four hours right facial paralysis. In forty-eight hours restless and delirious. Death on the fifth day.

CASE XXI. (Elliot, *Massachusetts General Hospital Records*, vol. cclxxvii. p. 69.)—A man, aged forty years, fell from a freight-car and walked a short distance. Partially conscious. Pulse 48 to 60, tense and full. Left pupil dilated and reacted slightly; right pupil normal. No paralysis. Stellate wound before and behind left parietal eminence. Slight bleeding from the left ear. Occasional twitching of the right arm and shoulder. Respiration 24, natural. Wound enlarged and no fracture found. Pulse remained about 64. In the evening grew slightly more unconscious.

Trephined six hours later in the centre of the wound. Dura was tense, bulging, and non-pulsating. Dura was incised. A slight amount of clotted blood oozed out, and the lacerated brain protruded. No fracture was found. Symptoms seemed due to laceration of the brain-tissue. Dressed, with drainage. Pulse rose to 100, and varied between 70 and 100 during the night; breathed with regularity. Seven hours after operation twitching of the left arm and shoulder. Twelve hours later the right pupil was unduly dilated and convulsions were present. Cyanosis, stertor, rapid respiration, rising pulse, and death sixteen hours later.

Autopsy. Fissured fracture starting just below trephine-opening downward and forward across parietal and squamous portion of the temporal bone just in front of the external auditory meatus, lacerating the middle meningeal artery. A blood-clot, about five ounces, lying partly in the middle and partly in the posterior fossa of the skull depressed the dura about an inch. The dura was intact.

CASE XXII. (C. B. Porter, *Massachusetts General Hospital Records*, vol. cclxxvii. p. 10.)—A man, aged thirty-three years, fell down an elevator-well two flights, and was immediately unconscious. In half an hour stertorous breathing was present, but he could be partially roused. Pupils were equal and reacted alike. A slight scalp-wound was found just to the right of the sagittal suture on the biauricular line. Six hours later the left pupil was contracted and fixed, and the right was dilated and fixed. Paralysis of the left side. Complete unconsciousness. Pulse rose to 180. Operation nine hours later.

On clearing the skull, a crack was seen running downward and toward the lambdoid suture, which was somewhat separated. The superior longitudinal sinus was found to have been torn. Sutures were passed beneath the sinuses with curved needles, and packing with gauze controlled the hemorrhage. Death on the table. Dura was found torn, and the brain was lacerated extensively.

CASE XXIII. (Scudder, *Massachusetts General Hospital Records*, vol. cclxxv. p. 265.)—A man, aged thirty-two years, fell from a freight-car. Unconscious. No interval of consciousness. Pulse 64, high tension; respiration 32, and stertorous. Pupils equal but contracted, and did not react. Œdema of right temporal region. Right eye bulged slightly, and the right upper eyelid was ecchymosed. No fracture of the skull detected. Moved arms and groaned when temporal region was pressed upon, and showed after two hours partial return to consciousness.

Operation in the right temporal region, and a fissured fracture found running to the base of the temporal fossa parallel to and just one inch behind the coronal suture. A slight depression on the anterior edge just behind and above the external angular process.

Trephined just in front of the fissure. Dura non-pulsating, dark in color, and rather tense. A little extra-dural blood removed (three or four drachms). Hemorrhage from the middle branch of the meningeal found by enlarging the opening downward and backward and the artery tied. The dura was torn along the lower portion of the fissure. A little lacerated brain-substance escaped. Gauze drain. Pulse fell during the night to 114. Roused by pressure on the third day. Conscious on the third day. Recovery complete in three months.

CASE XXIV. (*Massachusetts General Hospital Records*, vol. cclxxi. p. 186.)—Male. Fell from a freight-car. Bruise on the right side of the head. Pupils contracted and reacted but slowly. Pulse 84. In four hours convulsive movements of right face, passing to the left side of the body. Six hours later the pulse grew more rapid (160), short and weak. Stertorous respiration. Movements of the left arm after twenty-one hours.

Trephined over the left fissure of Rolando. Hæmatoma, intra- and extradural. Brain lacerated. Fissure of the skull directly across the vault. Death in two hours.

CASE XXV. (Park, *Medical News*, Philadelphia, December 3, 1892.)—A boy, aged fifteen years, was struck on the right side of the head by a wagon. Bruise and ecchymosis. No wound. Six days later there were no motor symptoms, but he was feverish and restless, with a rising temperature. Flattened and depressed area of skull felt back of the right parietal eminence. Linear V-shaped fissure with depression found above the right ear.

Trephined 5 cm. above the right ear, and found an extra-dural clot beginning to be organized, 10 by 6 cm. and 1½ cm. deep at the deepest portion. Recovery.

CASE XXVI. (Packard, *Medical News*, Philadelphia, 1894, p. 45.)—A man, aged twenty-seven years, fell from a wagon. Points of ecchymosis over the right parietal bone one inch from the median line. Œdema and tenderness on pressure. Patient dull and stupid.

Exploratory trephine over the right parietal bone under tender area. One ounce of extra-dural clot. No symptoms. Recovery.

CASE XXVII. (Harlam, London *Lancet*, February 24, 1894.)—A left-handed boy, aged sixteen years, received a blow above the right ear with a cricket-ball. He was dizzy, but continued to play for a while, and walked home, a few hundred yards. The accident was at 5 P.M., and he got home about 6 P.M. He soon felt sick and became semi-comatose. At 8 P.M. unconsciousness, stertor, pupils equal and reacting. Pulse slow and full; temperature subnormal. No paralysis. Three days later paralysis began in the left leg and spread to left upper extremity and side of face. Four days later more marked paralysis and reflexes absent. Anæsthesia over the paralyzed area. Pulse slower. Five days later unconsciousness less marked, but paralysis the same. Scalp showed slight abrasion at the top of the right ear.

Trephined one and a quarter inches above the right auricle. No fracture or clot. Second opening above and slightly in front of the first. A little blood from the upper posterior side. Third opening above and behind second. No clot. Hemorrhage from smaller branches of the posterior division of the middle meningeal diagnosticated. Thought best not to search further, but rely on having relieved the pressure. No drainage. In examining the third button of bone a fissured fracture of the internal table was found. Convalescence was slow, interrupted by the formation of a hæmatoma. Complete recovery in five months.

GROUP OF SUB-DURAL HEMORRHAGE CASES.

CASE I. (Schneider, *Archiv für klin. Chir.*, 1887.)—Stab-wound in the left temporal region received during a fight. Lay unconscious for an hour, as if in a swoon; then recovered consciousness, but could not speak. Could hardly move his right arm, and his right leg moved but little. Four days later right facial paralysis; consciousness complete; answered questions correctly by signs with the left hand. Paralysis of the right arm and paresis of the right leg. Pupils normal. Pulse 60. Wound nearly healed. Paralysis of the right side increased, so that finally the right arm and leg were almost powerless. Temperature remained normal. Pulse was slow; consciousness clear.

On the ninth day trephined over Broca's convolution. Dura was non-pulsating, a bluish blood-clot showing through dura. On opening the dura and removing a small clot a moderate-sized artery spurted from the depth of the wound, which was tied with catgut. The pulse rose to 80 after the operation, and speech began to return on the third day. Moved the right arm on second day. The facial paralysis had not entirely disappeared in six months.

CASE II. (Ceci, *Deutsch. med. Zeitung*, 1887.)—A fall, and two months later paraplegia followed by left hemiplegia. Ten days later the tongue turned to the right. Thickness of speech. Involuntary micturition. Coma.

Trephined over the right fissure of Rolando. Sub-dural clot found. Gradual and complete recovery. The diagnosis of a cerebral abscess was made before the operation.

CASE III. (Armstrong, *Journ. Amer. Med. Assoc.*, 1887.)—A man, aged fifty-three years, received a blow on the left forehead with a brick. Wound of scalp. Three months later paresis of the right arm and leg. Chills and fever.

Trephined over the left frontal bone. Dura dark and non-pulsating. The incision of the dura allowed the escape of fluid blood. Motion of arm and leg returned the same day. Complete recovery.

CASE IV. (Macewen, *Lancet*, August 11, 1888.)—A boy fell, bruising the face. Developed stupidity. On the sixth day convulsions began on the left side of the face, and extended to the left arm and leg. Consciousness continued. On the seventh day convulsions persisted and were accompanied by loss of consciousness.

Trephined over the centre of the right Rolandic fissure. A fissured fracture of the skull was found. The dura was dark-colored. When the dura was opened two ounces of fluid and clotted blood escaped. Recovery without incident.

CASE V. (Ball, *British Medical Journal*, 1888.)—A man, aged twenty-six years. Ten days before entrance received a blow on the head with a penknife. Since the accident there had been difficulty in speaking and pain in the head. Cicatrix small and extending deeply through the left temporal muscle, but fully healed.

Examination found motor aphasia, word-blindness, and word-deafness, but no paralysis. Five days after entrance symptoms increased, and trephining was done. A penknife-wound was found through the left temporal bone, and the dura and brain found to have been penetrated. The wound in the dura was enlarged, in which process the posterior branch of the middle meningeal artery was cut. On dilating the sinus in the brain, dark colored blood-clot escaped. More blood-clot was washed out by irrigation through a drainage-tube. Complete recovery interrupted by the recurrence of aphasia on the third day, due to the plugging of the drainage-tube.

CASE VI. (Walker, *Medical Age*, 1888.)—A boy, aged eleven years, fell twenty feet, striking on his head. Unconscious for half an hour. Vomited frequently small quantities of blood. The next day appeared aphasia and occasional delirium. Two days later spasms of the left arm, with turning of the eyes to the left. Started when spoken to and tried to get out of bed. Third day hemiplegia present. Vision impaired. Aphasia complete.

Trephined over right parietal eminence. A fracture was found extending from just above the external auditory meatus to the parietal eminence. There was also found a transverse fracture through the middle of the squamous portion of the temporal bone. The depressed portion was elevated. Dura was found dark-colored. Considerable hemorrhage. Clot was removed by irrigation. Motion of the arm and leg began to return in two days. Recovery in three weeks.

Case VII. (Owen, *British Medical Journal*, 1888.)—A boy, aged nine years, fell from a cart and was stunned. Drowsy, restless, and muttering. Five days later convulsions involving the right facial and suprahyoid muscles and extending into the right arm. He had nine of these convulsions during the day. Motor aphasia was present. On the sixth day the attack was severe, involving the right sterno-mastoid and diaphragm. On the seventh day aphasia and twitching.

Trephined over the centre of the fissure of Rolando on the left side. The dura was granular and bulging. Considerable dark blood escaped, and the edge of a solid clot was exposed in the lower portion of the opening. Another trephine was placed just below the first, and the clot was thoroughly exposed and removed. Recurrence of convulsions on the next day. On the second day the wound was opened. No clot was found under the dura, but the pia was bulging and covered with healthy granulations. The pia was opened and a little fluid blood escaped. Irrigation. Two slight convulsions the next night. No convulsions after this. Discharged well in one month.

Case VIII. (Matas, *New Orleans Med. and Surg. Journal*, 1889.)—A boy, aged nineteen years, received a blow on the left side of the head with a heavy stick, and was knocked senseless, but recovered quickly and walked home. Several hours later became worse, was stupid and staggered. Two days after the injury was semi-conscious. The right arm and leg were paralyzed. There was anæsthesia of the upper and lower extremities. Temperature 99°, and pulse 78. Swelling of the scalp over left parietal region. Answered questions incoherently. On the third day became comatose.

Trephined over left parietal eminence. The bone was slightly indurated. The dura was bulging and dark in color. One drachm of blood aspirated through the dura with a hypodermic syringe, and considerable blood trickled from the holes made by the needle. Recovery in fifteen days after slight suppuration.

Case IX. (Allingham, *Clinical Society Transactions*, pp. 22, 221.)—A man, aged forty years, fell from a tram-car. Did not remember the accident. The next day was drowsy. The following three days was drowsy and irritable. Pupils equal and reacted. No paralysis. On the sixth day more drowsy. Respiration labored and stertorous. Convulsions beginning on the left side of the face and extending to the neck, arm, and leg of the same side. Involuntary micturition. Pupils reacted slightly, and the right was a little larger than the left. No corneal reflex. Stertor increased and convulsions became more frequent.

Trephined on the right side over the fissure of Rolando. The middle meningeal artery, posterior branch, seen intact. Dura non-pulsating; a dark mass beneath it. The dura was incised and a large blood-clot removed. The clot extended as far as the finger could reach. The bleeding vessel ligated. Catgut sutures and drainage. The next day more rational. Could move the left leg, but not the arm. Recovery interrupted by retention of the wound-discharges and suppuration. Recovery complete in two months.

Case X. (Mills, *Journ. Nervous and Mental Disease*, 1890.)—A woman, aged sixty years, received a blow on the head. Unconscious. Boggy area over the right parietal bone. The left pupil did not react. The right pupil small and fixed. Paresis of the left arm. Right arm rigid. No sensation in the lower extremities. Breathing stertorous and sometimes Cheyne-Stokes. Involuntary micturition and defecation. For two days the pulse was from 64 to 100, and the respiration 20. On the second day moved when pressure was made upon scalp. Unconsciousness. On the evening of the second day died.

Autopsy. Sub-dural clot five inches long and two and a quarter inches broad over the upper temporal lobe, extending under the left parietal and frontal bones. Clot over the left cerebellar hemisphere.

CASE XI. (Chiene, *Trans. American Surgical Association*, 1891.)—A man, aged forty-two years, fell from a cab and was stunned, but recovered and gave name and address. Next day conscious. Was dismissed from the hospital on the fifth day, but readmitted on the sixth day. On the sixth day he lay on the left side with legs drawn up. Twitching of left side and face, jaws set, pupils equal and reacting slightly. The arms spasmodically contracted, especially the left. The right arm used more than the left. Pulse 80. On the seventh day twitching of the left face, arm, and leg. On the following two days this twitching increased in frequency and severity.

On the tenth day trephined just in front of the lower end of the right fissure of Rolando. The dura did not pulsate and was bluish and bulging. The dura was incised, and dark fluid blood escaped. The pulse rose from 60 to 80. Rigor on the evening of the thirteenth day; otherwise convalescence was uninterrupted, and he went to work in three months.

CASE XII. (Duret, *Cong. Trans. de Chir., Paris*, 1891.)—A man, age not given, fell from a cart. Temporary unconsciousness, followed by headache. On the thirteenth day aphasia. Slight right brachial paresis. Slight elevation of temperature. Sensory paresis of the right side. No apparent lesion of scalp or skull.

Trephined on the twentieth day over Broca's convolution. Sub-dural blood-clot and fluid blood. Ligation of two branches of the middle meningeal exposed by trephine and divided at operation. Spoke after two days. Aphasia gradually recovered. Died on the twenty-first day.

Autopsy. Congestion and œdema of the meninges over the whole surface of the encephalon.

CASE XIII. (Homans and Walton, *Boston Medical and Surgical Journal*, 1891.)—A man, aged twenty-eight years, fell from a carriage and was stunned, but recovered. Pupils equal, reacted. Pulse 60. Respiration normal. Hæmatoma in the right parieto-occipital region. On the third day delirium, followed on the fourth day by stupor and aphasia. Twitching of the right arm and leg, followed later by twitching on the left side. Later spasms became general and tonic in character. Partial consciousness.

Trephined over speech-centre near the lower end of the left Rolandic fissure. Dura bulging, tense and opaque. Hemorrhage found extending about in all directions. Pia mater cloudy and black just behind the fissure of Rolando. Brain considerably lacerated. Recovery in three months.

CASE XIV. (Elliot, *Massachusetts General Hospital Records*, vol. cclxxxi. p. 41.)—A man, aged forty-two years, fell twelve feet, striking an iron bar six feet from the ground. At entrance, pulse weak and 42 to the minute. Respiration stertorous. Right pupil unduly dilated. Moved the left arm and leg freely, but moved the right only occasionally.

Trephined in the right temporal region. Dura bulging, punctured. About half an ounce of blood spurted out under great pressure. Immediate relief to stertor. Pulse rose to 120. Pupils nearly normal and equal. Drainage. Nine hours later stertor, rapid pulse, cyanosis. Bronchi full of fluid. Died in fourteen hours.

CASE XV. (Beach, *Massachusetts General Hospital Records*, vol. cclxxiv. p. 43.)—A man, aged thirty-two years, fell from a car-step, striking his head. Unconsciousness was immediate and complete. Cut over the left eye. Hemorrhage from the left ear. Pupils equal and react slightly. Bruise on occiput. On the third day convulsions. Eyes turned upward and to the right. The right side of face, arm, and leg clonic spasms. Cyanosis. Convulsions frequently repeated.

Trephined over the centre for right shoulder. Dura dark, bulging and non-pulsating. On opening the dura considerable fluid and clotted blood escaped and lacerated brain-substance. Some fresh hemorrhage. At the close of operation there was stertor; the pulse feeble, from 150 to 180. On the following day the convulsions returned. On the second day convulsions, coma, and death.

CASE XVI. (A. T. Cabot, *Massachusetts General Hospital Records*, vol. cclvii. p. 214.)—Injury not known. Unconscious. Pupils equal, slightly contracted and reacting. Pulse full and slow. Respiration deep and regular. Bleeding from the right ear and left nostril. No paralysis. Œdema of the right occipital and post-parietal region, and a depression felt the size of a twenty-five cent piece. Ten hours later partially conscious. The following two days remained stupid, with conjugate deviation of the eyes to the right.

Trephined at the seat of the injury—that is, the upper posterior parietal region on the right side. Depression found less than one-eighth of an inch. Blood-clot from surface of dura. Dura non-pulsating. Four days later convulsions of the left arm, leg, and face. Dura opened, and about one and a half ounces of blood-clot removed, coming from the region of the fissure of Rolando. Dura sutured and skin wound closed. Two days later restless. On the third day spasms of the left side and face. On the fourth day restless, ptosis of the right eyelid, and dilatation of the left pupil. Convulsions of the left arm, leg, and face. Partially conscious in the afternoon. On the fourth day suddenly became comatose and died.

CASE XVII. (C. B. Porter, *Massachusetts General Hospital Records*, vol. cclix. p. 136.)—A man, aged twenty-four years, was knocked down in the street. Conscious, but dull. Pupils equal and reacting. Twenty-four hours after the injury pulse slow. Swelling in the right lower occipital region. At the end of thirty-six hours increasing stupor. During the next two days improvement in the mental condition, and wanted to leave the hospital, and was discharged against advice. Four hours later brought back restless and delirious. Convulsions of the left arm; head thrown back; right arm rigid. Respiration labored and stertorous, 30 to the minute. Right pupil dilated; left contracted and no reaction. Unconsciousness, coma; death four days after the injury.

Autopsy. Fissure in the right occipital fossa running into the foramen magnum. Small extra-dural clot in the right occipital fossa. Fissure running through the right occipital fossa across petrous portion of the temporal. Considerable sub-dural hemorrhage at the base of the left middle and anterior fossa. Laceration of brain.

CASE XVIII. (Wells, *N. Y. Medical Record*, May 14, 1892.)—Fell in the street. Unconsciousness was followed by frequent general convulsions. In three days convulsions became nearly constant. A small scar exposed on the left side of head above and in front of the ear.

Trephined under the scar and over the motor centres. Dura found adherent; no fracture, no depression. Dura dark, non-pulsating. On opening the dura a handful of clotted blood escaped, and the fissure of Rolando was exposed. Asked for a drink on coming out of ether. Recovery interrupted by occasional convulsions. Gave a history of a blow on the head three weeks before the present fall, followed only by severe headaches and weakness of the left arm and leg. Temperature 105° at the time of the operation. Blood-clot showed evidences of beginning breaking-down.

CASE XIX. (Bremer and Carson, AMERICAN JOURNAL OF THE MEDICAL SCIENCES, Phila., 1892.)—A man, aged twenty-one years, fell one story, but walked home. Temporary unconsciousness and fall one week later, then aphasia. Right facial paresis and tongue protruded to the right. Loss of sensation over the whole of the left side. Agraphia. Paresis of the right hand in about two weeks; this increased, and the right leg began to be involved. Dulness of mind.

Trephined one and a quarter inches behind the external angular process of the parietal bone, and a quarter of an inch above the base-line. Dura dark and cloudy, non-pulsating. A large amount of fluid and clotted blood under the anterior branch of the middle meningeal artery between the dura and arachnoid, which was flat and empty. On the fourth day recovered from aphasia. On the sixth day recovered from agraphia. Complete recovery in nineteen days. Hemorrhage in this case from the anterior main branch of the middle meningeal.

CASE XX. (Mynter, *Annals of Surgery*, 1894, pp. 19, 539.)—A man, aged twenty-five years, received a blow on the head with fist. Face and eyes swollen; severe pain in the back of head. On the twelfth day clonic spasms of right side of face and arm. Paresis of right side of face. Tongue drawn to the left. Left pupil contracted. Anæsthesia of face. Paresis of right arm and leg. Aphasia complete. Temperature normal. Pulse 96. On the thirteenth day could move right arm and leg, and seemed to understand questions, and to try to answer them. Restless. Pulse 120.

Trephined over speech and face centre. Dura bulging and bluish. On opening a stream of black blood spurted several feet into the air; three ounces evacuated. Clot three inches square and one-quarter inch thick. Brain then pulsated plainly, but appeared "compressed inward" and "excavated."

Sutured dura with catgut. Button replaced. No drainage. In two days said "yes" and "no," and in four days aphasia had disappeared. Paresis well in a week. Discharged well in four weeks, except for slight weakness of right hand.

CASE XXI. (Walker, *Cincinnati Lancet-Clinic,* June 17, 1893.)—A man, aged twenty-three years, received a blow on the left side of the head with a billiard cue. On the third day delirium. Right facial paralysis. Left pupil dilated and non-reacting. Involuntary micturition and defecation. Temperature normal. Scalp-wound two inches long on the left side of the head. Linear fracture of skull found under wound. Trephined under wound and dura found dark blue and bulging. A two-ounce blood-clot removed. Facial paralysis had disappeared on recovery from ether. On the eighth day hernia cerebri appeared and gradually increased to the size of a hen's egg. Hernia sloughed off in four weeks. Recovery in eight weeks.

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II.

MIDDLE MENINGEAL HEMORRHAGE.

BY G. L. WALTON, M.D.,
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THE subject of middle meningeal hemorrhage has been exhaustively treated in the foregoing paper. There are, however, a few exceptional conditions, of importance from a diagnostic point of view, to which I would call attention.

In the first place, it should not be lost sight of that a sinus as well as an artery may be ruptured by wounds, as the following case (seen in consultation with Drs. Homan and Hildreth, fracture of the base with hemorrhage having been the probable diagnosis) illustrates:

Male, aged nineteen years, received a blow on the left jaw in a friendly sparring-bout; reeled; became unconscious in a few minutes. Within four hours tonic rigidity in all extremities had appeared, preceded by restlessness. Pupils first dilated, then contracted; the left slightly larger. Clonic spasm of right hand added to rigidity. Respiration tertorous. Ankle-clonus. No bleeding from the nose or ears, or under he conjunctiva. Eyes deviated to the right; head turned somewhat to he left. On the fourth day twitching of the right eyelid and angle of the mouth; extremities relaxed and paralyzed; slight twitching of right hand and foot. Pulse at first 100, later 58 to 84. Temperature rose on sixth day to 106.4°, pulse to 130. Death on sixth day.

Autopsy by Dr. Swan. Surface of brain covered with extravasated blood under dura; most on left side and over occipital lobes. Middle fossa of skull contained several ounces of same, and base of brain covered with blood which extended into the vertebral canal. Small rent in left lateral sinus; no fracture.

To show that this is not a unique case, Dr. Pinkham, of Lynn, tells me that he found hemorrhage from the *longitudinal* sinus as cause of death following a blow received in a sparring contest in that city. He has not given me the details.

The next point to which I would allude is—

The hysteroid state. One factor in the diagnosis of hemorrhage, not mentioned in text-books, has impressed itself upon me, namely, the period of semi-consciousness which in certain subjects follows concussion and laceration, and gives rise to the suspicion of some more serious gross lesion, as hemorrhage. This condition is particularly likely to follow severe concussion in the case of young girls, though it also appears in adults, being by no means confined to patients previously disposed to hysteria. It seems rather the effect of profound shock and injury to brain-substance. It may, perhaps, be regarded as allied to the genuine traumatic neuro-psychoses. The patient, say a young girl, receives a severe blow on the head; a period of true unconsciousness follows. There is no bleeding from the nose or ears, no sub-conjunctival hemorrhage, no convulsive motion, no deviation of eyes or disturbance of pupils. The breathing is regular and of normal character. Notwithstanding the absence of other untoward symptoms, complete consciousness does not return for a number of days, or even weeks. There is apt to be in these cases retention of urine. After a number of days the question naturally presents itself, Have we not to do with a hemorrhage, and should not trephining be considered? The absence of all symptoms, excepting the unconsciousness, should lead to the suspicion that we have to do with a mental state, rather than with a gross lesion.

In one such case, carefully watched for days by Dr. Richardson, Dr. Mumford, and myself, the first suspicion of the true condition was aroused by the struggles of the patient against the introduction of the catheter and the involuntary flow of urine accompanying these struggles. This patient, after lying for a number of days in a condition of apparent unconsciousness, finally answered a question in a perfectly natural and petulant tone of voice, as if angry at being disturbed. Gradual recovery without unfavorable symptom followed, but it was some months before the balance was perfectly restored. In a somewhat similar case, called to my attention by the attending physician, typical hysterical hemi-anæsthesia followed a protracted period of unconsciousness which had caused great uneasiness and uncertainty of diagnosis.

Various mental conditions may follow this condition, among which refusal to talk is perhaps most frequent. This was the case in a patient in Dr. Mixter's service, seen by me in consultation. This patient, an adult, after having been struck by an engine, remained apparently unconscious for a considerable time without sign of gross lesion, with eyes sometimes held open, sometimes shut. He refused to answer questions for a long time. Whether there may or may not have been method in the subsequent mental state of this patient there can be little doubt that the trance-like condition at first observed was to be attributed to the blow.

Without referring to the medico-legal complications, which may add to the difficulties of analysis in these cases, I would simply emphasize the fact that hysteroid sub-consciousness supervening upon a blow is not to be mistaken for the deepening unconsciousness which indicates hemorrhage.

In the consideration of the collected cases the following are some of the points which have struck me as worth bearing in mind apart from the classical symptoms: Paralysis may occur without preceding convulsions. The interval of consciousness may be wanting. Rigidity may appear without preceding clonic convulsions. Bilateral rigidity does not necessarily point to hemorrhage at the base, nor even to a bilateral hemorrhage at the cortex, but may result from extensive unilateral middle meningeal hemorrhage. In the latter case the onset will be, however, unilateral.

The prognosis of aphasia, as well as of hemiplegia, resulting from cortical hemorrhage, is generally good, if the effused blood be removed by operation, even though considerable laceration has taken place.

Three months is the longest interval on record between the time of receiving the injury alleged to be the cause of the hemorrhage and the onset of symptoms resulting from hemorrhage. (I have recently seen a case with Dr. Richardson, in which five weeks of apparent health intervened, followed by coma.)

Anæsthesia may result from cortical hemorrhage, but far less frequently and less marked than motor paralysis. Stertorous respiration, though a serious symptom, does not contra-indicate operation. Coma does not contra-indicate operation. The pupils may remain unaffected.

In the exceptional event that one arm be paralyzed and the other convulsed or rigid, other symptoms must be depended on for the location of the hemorrhage. In case the injury is on one side, and the symptoms on the same side, operate on the side indicated by the symptoms, rather than at the site of the blow.

Symptoms of fracture of the base added to those of middle meningeal hemorrhage render the prognosis unfavorable. Tonic rigidity may appear in parts previously paralyzed as regards voluntary motion.

If symptoms of hemorrhage are present and operation is undertaken at all, exploration should be thorough, certainly sufficient to expose the posterior branch of the middle meningeal artery. Diagnosis of the side of lesion may be made from paralysis of the third nerve alone, if general symptoms of hemorrhage are present. In case of bilateral convulsion a dilated and fixed pupil alone may indicate the side of hemorrhage. Deviation of the eyes and head, though important in corroboration, affords little help as a localizing symptom.

III.

LOCALIZED HEMORRHAGE BENEATH THE PIA MATER OVER THE UPPER THIRD OF THE ROLANDIC AREA, DUE TO A FALL ON THE HEAD:

LOCALIZED CONVULSIONS WITHOUT LOSS OF CONSCIOUSNESS; LATER, SLIGHT MENTAL CONFUSION WITH PARALYSIS OF THE AFFECTED LIMBS, FOLLOWED BY PROLONGED COMA AND DEATH.[1]

By James J. Putnam, M.D.,
OF BOSTON, MASS.

The patient was a lady, seventy-two years old and of delicate health. The accident happened in the following manner: The house in which she lived was entered by a door at the top of four stone steps. Having walked up these steps she pulled the bell. The wire broke with her weight, and she fell backward onto the sidewalk. She was not fully stunned, however, and was able with some assistance to walk into the house and up a flight of stairs to her room. Dr. C. P. Putnam was called, but found her in good condition and discovered no signs of injury beyond a bruise and swelling of the scalp at the vertex. Later, I saw her a number of times in consultation. For twenty-four hours she seemed to be doing well. Then spasms began to occur in the left arm, and to a less degree in the left leg and the left side of the face. They were slight, of jerking character, not confined to any single segment, and not attended with loss of consciousness. These spasms recurred at short intervals during about two days. As they passed away the limbs became paretic and eventually paralyzed, and at the same time the patient's mental condition became disturbed. She grew somewhat talkative, but what she said was often irrelevant, the whole condition somewhat suggesting that of a person recovering from ether. Headache was scarcely complained of at all, and the pulse and temperature were unchanged or slightly increased. At the end of about two days more this state began to pass over into one of coma, which gradually deepened until her death, which occurred a few days later, or about ten days from the date of the accident. At no time did the pulse show the slowing usually supposed to attend compression. There was very little change in temperature at any period, but toward the day of her death it gradually rose to a slight degree.

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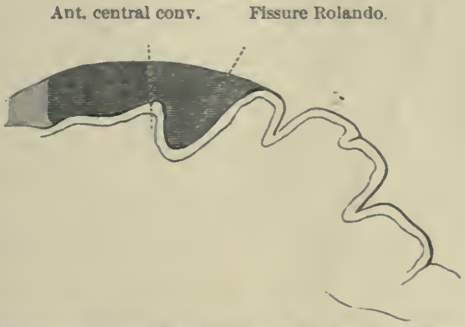
[1] Reported in connection with Dr. Scudder's paper.

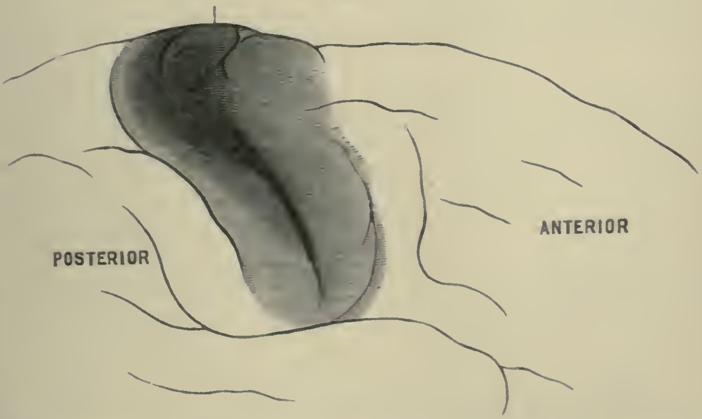
The post-mortem was made by Dr. W. F. Whitney, twenty-one hours after death, in the presence of Dr. C. P. Putnam and myself, and the following notes with the accompanying sketches were made by me on the spot.

FIG. 4.



Represents a cross-section at the thickest part of the clot, parallel to the median fissure and close beside it.

FIG. 5.



Shows the tapering of the clot toward its lower end, and indicates that the neighboring convolutions were covered with a thin layer of blood.

There was an extravasation of blood beneath the scalp covering the vertex and upper part of the occipital bone. The bone was not fractured. An extensive subdural hemorrhage covered the right hemisphere of the brain over its posterior half to near the point of the occipital portion. Besides this, a thick clot lay in the fissure of Rolando, at its upper portion, with the pia stretched smoothly over it. The central convolutions were forced apart by the clot at their upper end, and the anterior central especially had evidently been subjected to considerable pressure. The arteries at the base were highly atheromatous.

The chief interest of this observation lies in the fact that the clinical features were somewhat different from those ordinarily seen in cases of hemorrhages of localized character, and in the indication furnished by the post-mortem, that an operation might perhaps have been done with benefit. It is almost needless to say that the propriety of operating was repeatedly discussed by my brother and myself as the different phases of the illness showed themselves, and had the signs of compression been more clear, or had the patient been younger and stronger, operation would have been decided on. But the earlier symptoms seemed to point to laceration of the cortex more than to localized hemorrhage from the middle meningeal artery, and the later symptoms were of equivocal significance. The idea of a defined clot from the pial veins did not occur to us, but we did discuss the probability of extensive and spreading sub-dural hemorrhage, and decided against an operation to relieve it in view of the uncertainty of the diagnosis, the patient's age and naturally feeble condition, and the prostration induced by the accident. I do not even now think that we were wrong, and it is doubtful whether the recovery would have been complete at the time when it would have seemed justified by the urgency of the symptoms, even if the operation had been primarily successful.

With a younger patient the results would no doubt have been excellent.

The history of this case, as of so many others, shows the unreliability of the absence of "pressure-pulse" as disproving compression.

Symptoms of cerebral excitement have been observed in cases of hemorrhage involving the cortex, and are especially noted by Gowers in his *Diseases of the Nervous System.* In uncomplicated middle meningeal hemorrhage such symptoms must be rare, if they are ever observed, unless the dura is broken through. The occurrence of such an isolated, defined, and large pial hemorrhage as this must be very rare, and, as the case puzzled us, the report of it may help to solve a doubt for someone else. [Since this report was first made microscope sections have been prepared from the dura with its hemorrhage, and the existence of an old and vascular false membrane established. It was from these vessels that the sub-dural hemorrhage had occurred.]

A CONTRIBUTION TO THE PATHOLOGY OF LARYNGEAL PHTHISIS.

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Laryngeal phthisis is acknowledged to be rarely a primary disease, whilst, on the contrary, it is quite a common complication in pulmonary tuberculosis. Regarding its origin in the latter case, auto-infection is freely accepted by all, though there still exist those who hold that the deposits of tubercle bacilli in the laryngeal tissues have been conveyed there chiefly by the blood and lymph streams, as opposed to those who hold this to be the rarer channel of infection as compared with their introduction from the surface, being carried from the lung in the sputum.

There can be little doubt, as far as clinical and pathological evidence shows, that both these channels of infection exist, either acting separately, conjointly, or one following the other.

The shallow tubercular ulcers are the product of surface-infection, and probably that form of disease which starts between the muscular layers and deep to them is caused by the first-mentioned cause. When deep involvement and superficial ulceration are present it is difficult to form an opinion as to whether blood or lymphatic infection is present, or whether the infection is exclusively from the surface.

The points to which I wish to draw attention are chiefly that the surface-infection is caused originally by the micrococci present along with Koch's bacillus in the sputum, and that the ulceration and tubercular infection are secondary to abscess-formation in the epithelium; and incidentally to the question as to whether the bacillus itself often finds its way between the epithelial cells.

To deal with the latter question first, as the evidence is chiefly negative, I quote Fränkel,[1] being, as far as I can find, the only observer who has absolutely demonstrated Koch's bacillus in the inter-epithelial spaces. For my own part, I must say that I have failed to demonstrate tubercle bacilli in the epithelium, even when the corium has been partly destroyed by ulceration, though the greater the depth of the epithelial ulcer apparently the greater is the probability of finding them.

Heinze[2] in his observations on the cadaver most emphatically corroborates the fact that the shallow ulcers are non-tubercular, when he says that out of fifty lesions 83 per cent. were specific and 17 per cent. were not; these latter were shallow ulcers, and no bacilli were found in them.

Whether Heinze himself intends the interpretation here put to his investigations one cannot tell, but it certainly bears that rendering well, and one is justified in suggesting it.

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[1] Deutsche med. Wochenschr., 1879, No. 2.

[2] Bosworth: Diseases of Nose and Throat, pp. 608 et seq.

Basworth[1] makes various allusions and remarks on the subject, some of which are repeated here from the direct bearing they have on the subject.

He says, "The theory of Louis, ... that the laryngeal ulceration results from the eroding action of the sputum as it makes its way over the laryngeal tissues from the diseased parts below, is at the present day indorsed by but few observers;" and further on, "that auto-inoculation of the laryngeal membrane is altogether probable; that this should occur, however, it is necessary that the lesion should be the seat of catarrhal erosion." To quote once more from the same author, "the influence therefore of a chronic laryngitis as a predisposing cause of tubercular disease is altogether probably greatly over-estimated, although it is undoubtedly true that a phthisical patient suffering with chronic laryngitis, especially if this has resulted in erosions, is more likely to develop tubercular action than one in whom the laryngeal membrane is in a state of health."

Regarding the theory of Louis one only needs insert the term microorganism-laden before sputum, and the theory is quite that usually accepted. With the second quotation not many will disagree, though for my own part I must admit that I look upon a catarrhal laryngitis in tubercular disease of the lungs as being a distinct warning to attend to the larynx.

Moritz Schmidt[2] agrees with Schottelius's view, that in hypertrophic conditions of the interarytenoid space the bacillus-laden sputum is retained between the rugæ, and by maceration and irritation causes ulceration, and thus the bacillus finds an entrance into the tissues.

Here, again, is corroborative evidence in favor of a discontinuity of surface being requisite before infection takes place. My own observations quite tally with this—that is to say, ulceration is frequently present at the base of the clefts, whether caused by surface ulceration or by microscopic abscess-formation, I cannot say; probably both, for the epithelium is very thin in this situation when compared with that over the hypertrophies.

From the foregoing *résumé* it is clear that most observers consider destruction of the epithelium one part, if not in its entirety, the first stage to tubercular ulceration in the larynx; the point which now remains to arrive at is, how this ulceration takes place, whether by desquamation or otherwise.

A by no means unimportant question here is the "catarrhal" ulcer; firstly, does it exist? One must admit the existence of ulceration, neither tubercular nor syphilitic; but is it catarrhal? If a catarrhal ulcer exists, and comes into existence by simple erosion, always excepting those cases where excretion is pent up in a crevice, then, naturally, nothing further is to be said regarding the ulceration.

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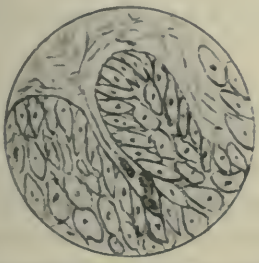
[1] Die Kehlkopfschwindsucht, etc., Leipzig, 1879 (Lennox Browne).

[2] Moritz Schmidt: Die Krankheiten der oberen Luftwegen, p. 289.

But in none of my sections has any evidence of ulceration thus produced been found, nor has it been proved elsewhere.

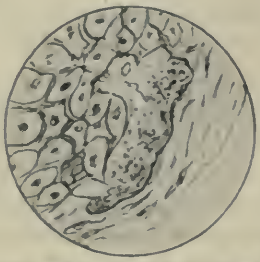
In many cases of hypertrophy of the posterior wall of the larynx the masses do not show changes from simple hypertrophy, though pulmonary phthisis is clearly present. The posterior wall is chiefly referred to for the reason that the curette can easily remove hypertrophic masses of tissue here, whereas in other situations the surface only of the ulcer can be scraped off.

FIG. 1.



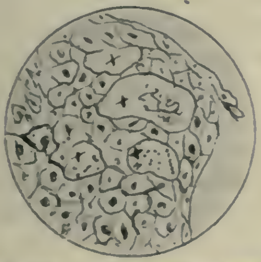
Three phagocytes in an interpapillary cleft: the phagocytes are full of cocci. × 1/12 oil immersion.

FIG. 2.



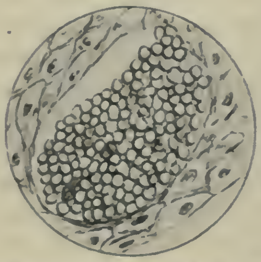
Epithelial abscess just below the surface full of detritus. × 1/12 oil immersion.

FIG. 3.



The crosses (×) are in small abscess-cavities containing cocci.

FIG. 4.



Large epithelial abscess full of pus.

In a considerable number of these little masses I have found a certain fairly uniform condition, viz., the submucous tissue is practically healthy, but in the epithelial layer there is a tendency to abscess-formation. These tiny abscesses are filled with leucocytes which have found their way up through the lower layers of epithelium, Fig. 4, and as the abscess, either by reason of normal desquamation or normal epithelial growth, approaches the surface, the leucocytes become converted into granular detritus, Figs. 2 and 3. In Fig. 1 is shown a papilla in which are seen three phagocytes conveying cocci from the surface.

In none of the epithelial abscesses have I seen a single tubercle bacillus, but I have found cocci in some. It has been shown by a large number of observers that the parts most favorable for the development of tubercular ulceration are those covered with squamous and not ciliated epithelium. This is doubtless perfectly true, but it has no actual bearing here, for, whereas it was accepted for bacilli, it must be admitted for cocci and bacilli together.

So I would put forward the following as the probable processes or stages through which the affection of the mucosa passes from health to tuberculous ulceration. Before doing so, I would say that in pulmonary tuberculosis in which there are no other micro-organisms present these arguments would not hold good.

Also, I would draw attention to the experiments which go to prove that the tubercle bacillus of Koch does not of itself cause abscess-formation, but requires the presence of cocci.[1]

Thus, as a primary factor, I would suggest that the micrococci being at rest on the epithelial surface between the attacks of coughing, and especially during sleep, find their way into the interstices between the cells. Some of these are removed by phagocytes; others are, by reason of their numbers, able to establish themselves, and, by destroying cells and phagocytes, form a small abscess. The abscess ruptures, and is still, bacteriologically speaking, non-tubercular. The ulceration continues, and as the abscess increases in depth the risk of infection by Koch's bacillus increases, and by the time submucous tissue is reached, if not earlier, this certainly occurs.

Inasmuch as these ulcerations take place very frequently in the posterior commissure, and perhaps more frequently there than elsewhere, and that they also are more frequent when hypertrophy is present, catarrh, by producing them as well as a general thickening of laryngeal epithelium, must predispose to infection.

From these and other observations it seems clear that when considering the question of treatment, whatever method is adopted, there are certain facts which might well be borne in mind, viz.:

Ulceration is not the first symptom of laryngeal invasion. The presence of other micro-organisms in the sputum probably increases the risk of laryngeal invasion.

If by intertracheal medication the bacteria can be rendered harmless, the larynx will be favorably influenced. In superficial ulceration caustic applications, viz., chromic acid 3 per cent., antiseptics and lactic acid, are all equally efficacious.

As assistant in Dr. Bond's clinic at Golden Square, I have had a very fair number of these cases, the custom being to follow Heryng's treatment, locally, with internal administration of creosote; but when there was nothing but simple superficial ulceration, 3 per cent. solution of chromic acid carefully applied yielded excellent results, and this is not to be wondered at, for it hardens the membrane to act as a protective investment. Thyroid extract, so beneficial in lupus, yielded no results in any cases so treated in the forementioned clinic.

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[1] Strauss: Sem. Méd., May 10, 1894; N. Y. Med. Journ., July 7, 1894.

RAPID GLIOSIS OF THE SPINAL CORD, WITH REPORT OF A CASE.[1]

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During the past ten years there has come into existence an abundant literature illustrative of the clinical and pathological features of that disease of the spinal cord of which the essential feature is a widespread neurogliar hyperplasia, and to which the name syringomyelia has been very generally misapplied, owing to the fact that cavity-formation is a frequent (though unessential) accompaniment of the process. A characteristic of a very large majority of cases of this disease is a chronic afebrile course. Occasionally, however, it happens that a pathological process, consisting of neurogliar hyperplasia of the spinal cord runs a rapid febrile course, and presents to the clinician a picture which has few points of resemblance to the typical chronic cases. The infrequent occurrence of these cases, the difficulties that attend their recognition during life, and their pathological characteristics render it important that they should be put on record.

R. R., aged one year, was admitted to the Babies' Hospital on February 21, 1894. The family history is good. There are two other children by the same parents who are healthy. About three months ago the child, Robert, was noticed to be weak in the right arm and hand, and it was observed at about the same time that the head dropped forward. The motor paralysis of the right arm gradually increased. The child had been fed on milk and oatmeal or other cereals.

On examination the child was found to be well nourished. There was complete loss of power in both arms, including loss of power in the shoulder-muscles. The muscles of the arm and hand were all markedly atrophied and flabby in consistence. The muscles of the neck were

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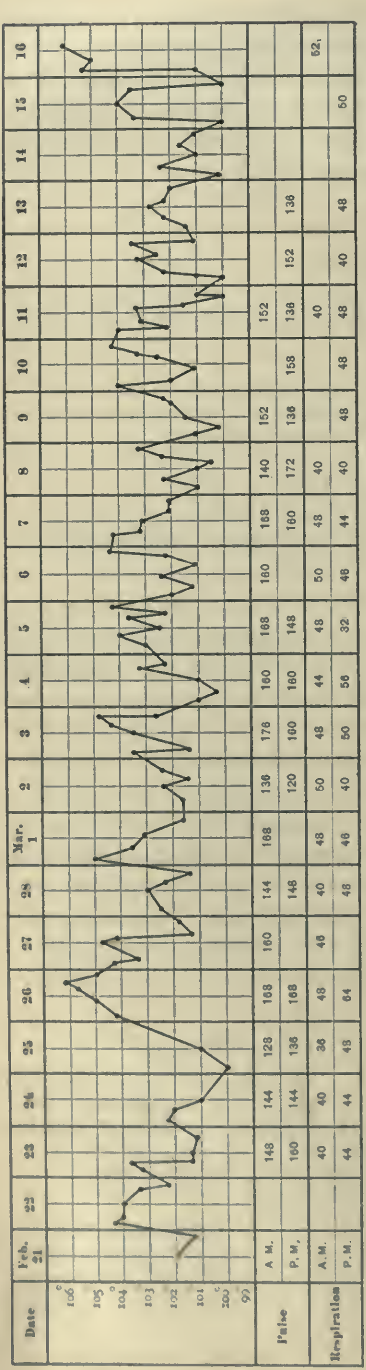
[1] Read before the New York Neurological Society, by Dr. Herter, December, 1894.



exceedingly rigid, and the head was carried stiffly, slightly in advance of the normal position, with the face looking directly forward. Lateral and rotatory movements and extension of the head were very limited. There seemed to be some loss of power in the legs, but it was difficult to be sure of this. The knee-jerks were greatly exaggerated, that of the right side being especially active. Ankle-clonus was obtainable on both sides, but was better developed on the right than on the left side. The abdominal and epigastric reflexes could not be elicited. In the pharynx there was a very marked bony prominence, corresponding to the level of the third cervical vertebra. The eight upper incisors were slightly decayed and very short. The lower incisors were notched. There was considerable dyspnœa. Respiration was rude over almost the entire chest. There were medium or fine râles over the base of the left lung. The temperature on admission was 102°. On February 22d the temperature reached 104.5°, and the patient was restless during the night. On February 24th the temperature fell from 102° to 100°. There was repeated vomiting and breathing was labored. On February 26th the temperature rose to above 106°, and fell on February 27th to 103.5°, from which it again rose nearly to 105°, to fall later on the same day to 101°. The patient vomited twice on this day. On February 28th the breathing became entirely thoracic. Vomiting occurred at 8 A.M. and at 1 P.M. On March 1st the temperature reached 105° and fell to 101.5° later in the day. On March 2d the patient refused the morning feedings and vomited at 4 and at 7 P.M. On March 4th it was noted that there was general partial analgesia below the arms and that power in the legs was not essentially changed. The pupils responded to light, were equal, and were normal in size.

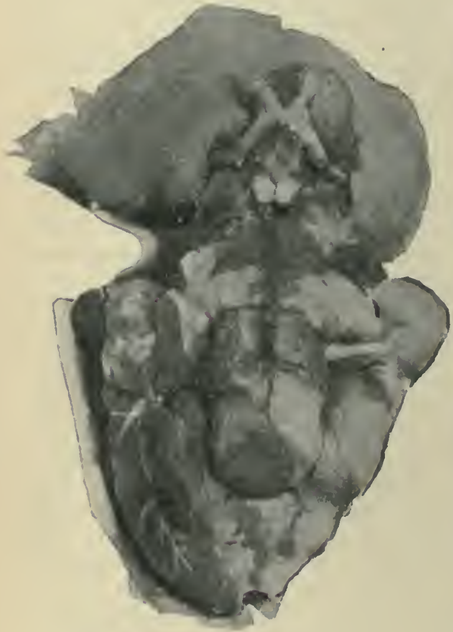
The breathing still continued thoracic. Vomiting occurred at 4 and at 7 P.M. On March 5th vomiting occurred at 3 and at 7 P.M. On March 6th vomiting occurred at 5 P.M. The patient was very restless during the night and vomited once. On March 14th there was an abundant purulent discharge from the left ear. Throughout the right lung were many fine, moist, crackling râles. There were no signs of consolidation. There were coarse râles over lung at the base behind. Vomiting occurred at 12.30 P.M. There was considerable nasal discharge. The condition was stationary as regards other symptoms. On March 16th, at 8 A.M., the face was flushed, there was slight strabismus, and the head was rolled continually from side to side. The pulse was hardly perceptible, and at times there was marked cyanosis. The temperature rose to 106° and the respirations to 52. At about 6 P.M. the patient died.

During the time that the patient was under observation the temperature was extremely irregular and frequently very high. Thus, on February 21st it rose to 104.5°, on February 26th to 106°, on February 27th to 104.4°, on March 1st to 105°, on March 3d to 104.8°. on March 5th to 104.5°, on March 6th to 104.5°, on March 10th to 104°, on March 11th to 104°, on March 15th to 104°, and on March 16th to 106°. The pulse varied from 120 to 172. The respiration varied from 32 to 52 per minute. The patient was fed on cream and barley-water or peptonized milk, and was moderately stimulated most of the time by means of whiskey. He also received small doses of calomel from time to time. The ice-cap and alcohol sponge-bath were used for restlessness and for the reduction of temperature.

Pathological examination. The medulla, pons, crus, part of the cerebellum, and a portion of the basal ganglia on either side, the entire spinal cord, and the cauda equina were removed ten hours after death, and soon placed in Müller's fluid. The spinal cord was cut from the medulla at a point half an inch below the anterior pyramids. The surface of the lower end of the medulla presents a large, irregular, somewhat projecting grayish mass, of firmer consistence than the normal substance of the medulla. It occupies almost the entire right side of the medulla, except a small zone anteriorly, and the left side of the medulla with the exception of a narrow irregular border around the edge. The medulla is considerably enlarged from before backward and from side to side (three-quarters of an inch from side to side and five-eighths of an inch from before backward). (Figs. 1 and 2.) The medulla is almost the same size at its upper and lower ends. The spinal cord is much enlarged at its upper end, being seven-eighths of an inch in diameter from side to side, as the specimen lies on its posterior surface, and half an inch from before backward. The very considerable enlargement of the cord extends to the eighth cervical segment. From this level to the sixth dorsal segment the cord is still somewhat larger than normal, but below this point it appears of normal size. The cord measures half an inch from side to side at the level of the first dorsal segment, and three-eighths of an inch at the seventh dorsal.

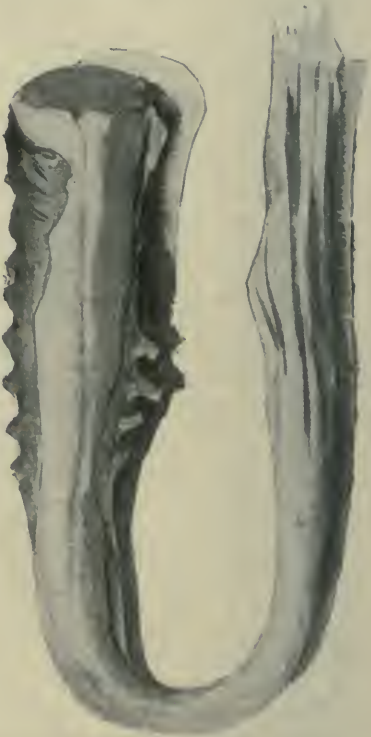
The specimen was hardened in Müller's fluid and alcohol, and sections were made from each segment of the spinal cord and from the medulla and pons. The sections were stained by Weigert's method, and by Van Giesen's picro-acid-fuchsin method. In sections made at the level of the first cervical segment the nervous structures are so extensively replaced by the elements of the new growth that it is with difficulty that the anterior and posterior parts of the cord are to be distinguished even on microscopical examination. The topography of the gray and white substances is entirely destroyed. By means of the Weigert stain, areas of degenerated nerve-fibres may be made out here and there at the periphery, especially along the antero-lateral edge of the cord, but in all other parts of the sections not even the remains of cells and fibres can be made out. The new growth has a typical gliomatous structure. It consists in some places of a delicate network of neurogliar cell-processes, with few cellular elements; in others of a more compact neurogliar network, containing a great abundance of small spheroidal cells with small cell-bodies. The latter structures stain more deeply than the former. In most places, in addition to the small spheroidal cells, are larger spheroidal, oval, or pyramidal cells, often with several processes, and sometimes containing several nuclei. These are the glia-cells of Deiters. In some places these are abundant, in others scanty. In many places bloodvessels are numerous and large. Many of them have thicker walls than normal. Some vessels are surrounded by a moderate number of small spheroidal cells that appear like leucocytes. The central canal cannot be made out, and there are no traces of the cells lining it.

FIG. 1.



Showing position of tumor in lower part of medulla.

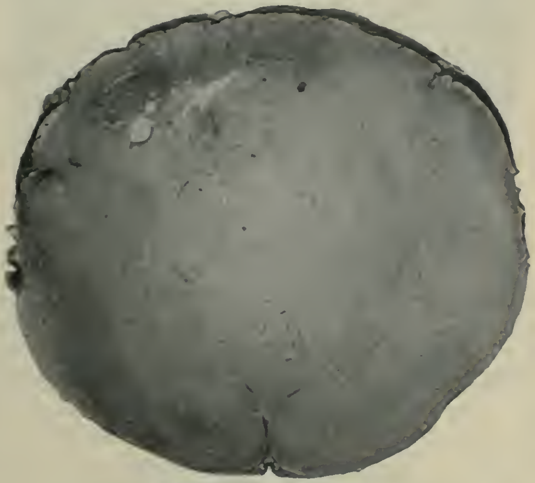
FIG. 2.



Showing enlargement of cord and position of tumor.

The second cervical sections differ from the first in that their topography is less confused. The remains of the anterior horns can be made out by the presence of a few shrunken ganglion cells without processes. At the posterior edge of the central canal the epithelial lining is broken through, and the lumen of the canal is filled with glia-cells of various shapes, some of them undergoing degeneration. In the vicinity of the canal are many glia-cells whose protoplasm has become granular, and which stain imperfectly. (Fig. 3.) Here and there these degenerating cell-bodies appear to have coalesced, with the formation of homogeneous, badly staining, irregular-shaped lumps. About the periphery of the cord, and almost surrounding it, is a narrow zone of partially or completely degenerated nerve-fibres. Sections from the third cervical segment do not differ materially in appearance from those of the second segment.

FIG. 3.

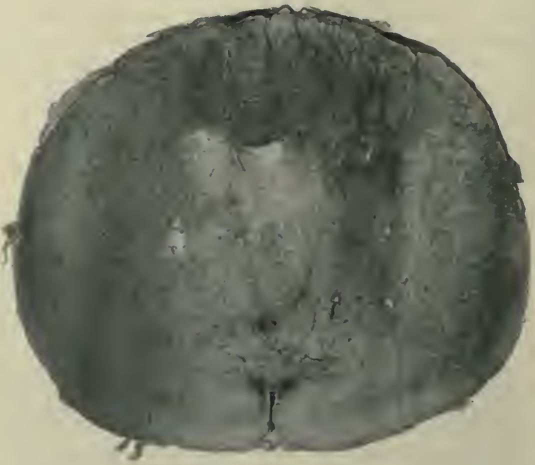


Second cervical segment.

Sections from the fourth segment are still greatly confused as regards the topography of the gray and white substances. The neuroglia growth continues to occupy all the cord, but there is a narrow border which surrounds the cord except at that part which lies between the posterior nerve-roots, and contains many degenerated nerve-fibres scattered among the proliferated neuroglia cells. A few fibres appear to retain their axis-cylinders, and this is apparently true also of some of the fibres in the anterior nerve-roots. The structure of the growth does not differ materially from that at a higher level, but it is noticeable that about the end of the anterior median septum lie a large number of the largest neuroglia cells, many of them undergoing degeneration. No central canal exists, but in the region where it normally is are many cells grouped closely together, amid the larger neuroglia cells, which have the character of ependymal cells with long processes. In this neighborhood are many areas of considerable size, in which the various elements of the neuroglia tissue are undergoing degenerative change. A few degenerated ganglion cells can be made out in the region where the anterior horns might be expected to lie. (Fig. 4.)

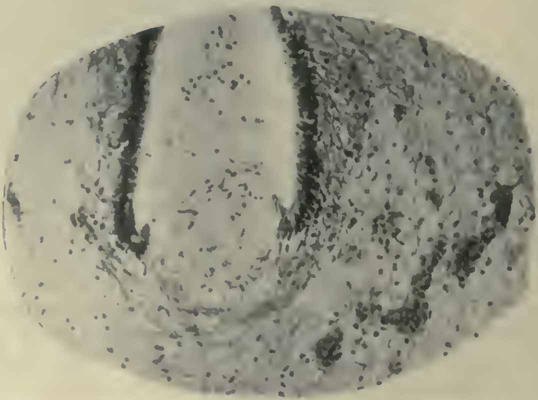
In sections from the seventh cervical segment there are clear indications of the pressure-effects of a new growth developing from the centre of the cord. The glia-invaded gray substance of the anterior horns has been pressed laterally into a long narrow band of somewhat crescentic outline, with its convex borders directed to the edge of the cord. The degenerating ganglion cells, with their shrunken cell-bodies, lie in a long narrow line in the area just mentioned, which contains a great abundance of degenerating glia-cells of the larger size. About the edge of the cord, anteriorly and laterally, is the zone of degenerated nerve-fibres already noted in sections at higher levels. This zone is considerably wider, especially anteriorly, than it was higher up. No nerve-fibres can be seen that appear normal. The inner edge of this zone is bordered

FIG. 4.



Fifth cervical segment.

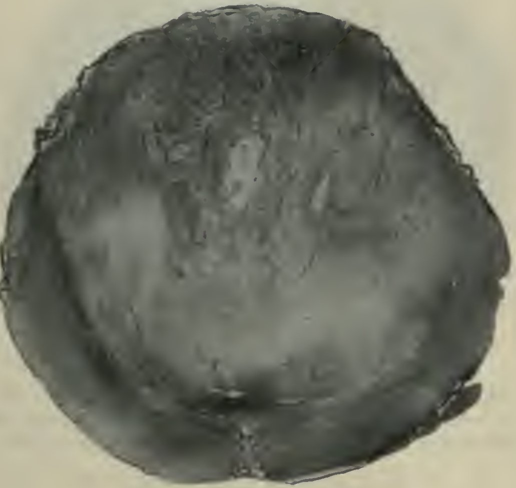
FIG. 5.



Seventh cervical segment. Foramen and central canal of cord invaded by gliomatous tissue.

by the outwardly displaced area of gray matter just mentioned. In the region of the central canal are some appearances of interest. The canal itself is quadrilateral in shape, and is lined with an unbroken layer of columnar ependymal cells, except at the posterior wall, which is broken through by a mass of the larger glia-cells, which partially fill the canal. (Figs. 5 and 6.) A short distance posterior to the canal lies a small ring of ependymal cells, the space between this group and the canal itself being occupied by a comparatively dense neuroglia network with numerous oval, neuclei-containing cells. The more centrally situated cells are undergoing degeneration. The pial septum of the anterior median fissure is less deep than normal, having been pushed forward by the growth of the tumor, and part of the pia has been pushed to the right, part to the left of the line of the fissure. In the triangular space thus made, the neuroglia network is particularly dense, and stains deeply with picro-acid-fuchsin. This tissue contains a large number of elongated or triangular-shaped nuclei, the appearance of which suggests that they are near derivatives of the ependymal cells.

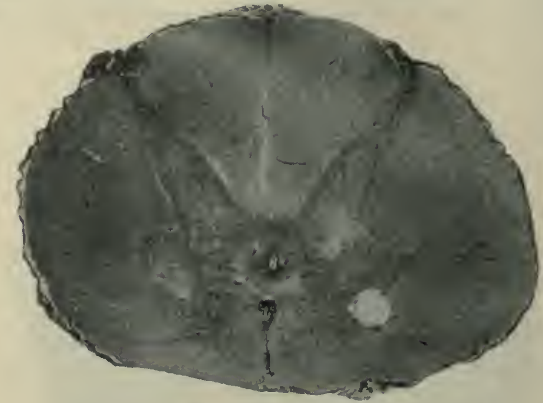
FIG. 6.



Seventh cervical segment.

In the first dorsal segment of the cord the outlines of the gray substance are distinct, although not so distinct as they should be. Many of the ganglion cells of the anterior horns are visible, but the greater number have lost their processes, have granular cell-bodies, and are somewhat shrunken in appearance. The gray substance contains a great number of neuroglia elements, particularly great numbers of Deiters' cells, which are undergoing hyaline degeneration. The remains of the fine network of medullated fibres can be distinguished in the Wiegert preparations. The white substance of the cord is extensively degenerated, especially in the posterior columns, where no normal fibres can be distinguished. (Fig. 7.) The most striking feature of sections at this level is the presence, about the central canal, of a great abundance of nuclei, like those of the ependymal cells, which tend to aggregate in larger and smaller groups. This is also a very noticeable feature at the third dorsal level. The chief features of the fifth dorsal segment are the presence of a few ganglion cells with intact processes, a great number of

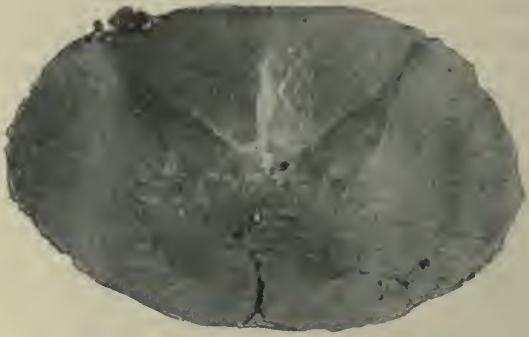
FIG. 7.



Fourth dorsal segment. The cavity is an artefarct.

normal-looking fibres among the degenerated fibres of the white columns, and numerous large masses of hyaline substance (degenerated neuroglia cells), especially about the bloodvessels of the central region of the cord. (Fig. 8.)

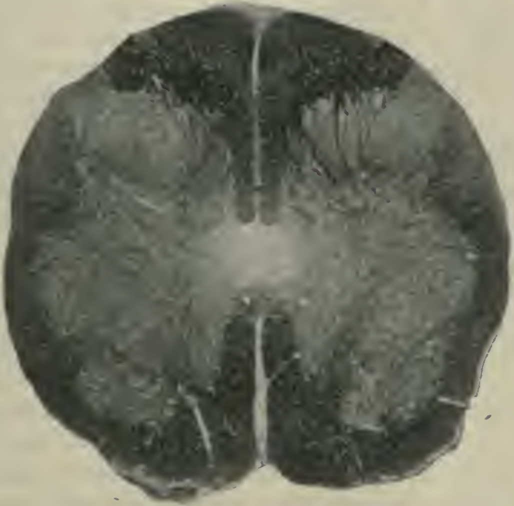
FIG. 8.



Fifth dorsal segment.

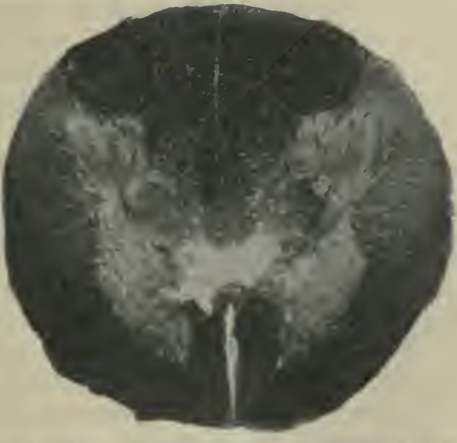
When the eleventh dorsal level is reached the white matter of the cord is quite normal even in the posterior columns, and the nerve-cells of the anterior horns and Clarke's columns are apparently intact. There continues to be, however, considerable disturbance about the central canal, where there are numbers of the nuclei above described. These, and other neuroglia cells, have invaded the anterior and posterior commissures, and are apparently responsible for the degeneration of their nerve fibres. (Fig. 9.) Throughout the rest of the cord the conditions differ little from those just described for the eleventh dorsal segment. Both the gray and the white matter are normal in the greater part of their extent. It is only about the central canal that pathological changes are seen. The ependymal cells of the canal are surrounded, as above, by a rather dense network of neuroglia processes in which lie many nuclei having the same character as the nuclei of the ependymal cells, and numerous small spheroidal cells. The network of fine medullated nerve-fibres in this region is damaged or destroyed, especially in the parts posterior to the canal. (Fig. 10.) At the level of the third sacral segment this condition is still well marked. About the area of neuroglia cell-proliferation is a narrow area of degenerative change in the gray

FIG. 9.



First lumbar segment. Gliomatous tissue about central canal.

FIG. 10.



First sacral segment. Gliomatous tissue about central canal.

substance. Passing upward from the spinal cord to the medulla, it is found that the new growth rapidly decreases in size. Sections through the medulla at the level of the middle of the hypoglossal nucleus show the presence of many new glia-cells just beneath the ependyma of the ventricle. Many of the cells of the twelfth nerve-nucleus are shrunken and have lost their prolongations. The rest of the structures at this level are apparently normal, including the vessels. At the middle of the pons no deviations from the normal can be detected. Throughout the cervical and dorsal regions of the cord the vessels of the tumor are numerous, the adventitia is often thickened and is sometimes the seat of hyaline degeneration. About many vessels is a slight increase in the number of small spheroidal cells. In those portions of the cord where the new growth extends to the surface the pia shows an increase in connective-tissue cells and is somewhat thickened. The vessels of the pia are in many places apparently larger than normal, and, in some places, are the seat of degenerative change.

Outside the nervous system there are no lesions.

Having described with some detail the appearances at different levels of the cord, it remains to consider the interpretation which is to be put upon them. In structure the new growth corresponds to a glioma. It is, in fact, a glioma which involves almost the entire extent of the cord. That the growth originated in the neighborhood of the central canal is indicated by the appearances in the lower part of the cord and by the gradual advance of the tumor as one passes from below upward, from the centre to the periphery of the cord, until the entire transverse extent is implicated.

It seems probable that the new formation of glia-cells began in the proliferation of the ependymal and peri-ependymal cells. The recent researches of His and others have taught us that the neuroglia of the cord is developed from the epiblastic columnar cells, which form the foundation of and line the primitive neural canal. From this lining of germinal cells are derived the cells known as spongioblasts, which extend outward and develop into the neuroglia of the cord. By a slight modification of the germinal cells are produced the neuroblasts, which by their proliferation give rise to the nervous structures of the cord. The appearances in the preparations under consideration render it probable that the glia-cells of the new formation were derived from the proliferation of cells of the type of the ependymal cells and the isolated groups of peri-ependymal cells.

According to this view, the new cells have the same origin as the spongioblasts. There is no evidence in these preparations that there has been any proliferation of the nervous elements, the derivatives of the neuroblasts; but this may conceivably happen under some conditions. Of the two forms of tissue, spongioblastic and neuroblastic, the spongioblastic is biologically to be regarded as the lower and less differentiated form; and it is not singular that it is in tissues genetically related to this form that the power of cell-division is retained in high degree.

It is to be regretted that the preparations under consideration were not studied according to the modern methods of cytology. There is little doubt that the adoption of the methods now in use among biologists for the study of the cell will in the future throw considerable light upon the nature of new growths generally, by making possible a more thorough study of the processes concerned with cell-division.

Regarding the relation between the position and nature of the lesion and the symptoms that were noted there are several points of interest. Although the new growth or the groups of abnormal peri-ependymal cells already referred to involved the entire extent of the spinal cord, it is only to the developed growth in the upper half of the cord that symptoms are to be attributed. The new growth reached its maximum development in the cervical region, and it is probably in the lower part of this region that active proliferation of the neuroglia cells began. This corresponds with the fact that the first observed symptom was weakness in one arm. That the right arm should have been paralyzed somewhat earlier than the left seems to correspond to the fact that at the beginning of its growth the new formation compressed and involved especially the right half of the spinal cord. The analgesia below the neck, the spasm in the leg, and the heightened reflexes are, of course, merely the usual results of a total transverse lesion of the cord in the cervical region. The spasm of the neck-muscles was the spasm characteristic of irritation of cervical nerve-roots.

The high temperature observed during the entire time that the patient was under observation cannot be referred to the pulmonary condition. It is likely that this temperature, a very unusual feature of tumor of the cord, was due to the rapid destruction of nerve-elements in the cervical cord. That rapidly destructive lesions of the lower segments of the cervical spinal cord are capable of causing a rapid, considerable, and sustained temperature is now a well-established fact. The phenomenon is observed especially in crushing-lesions of the spinal cord, in which one of us (Herter) has observed it a number of times. In rapidity of tissue-destruction the present case is, of course, not comparable to crushes of the cord, but the destructive process was sufficiently rapid to render this explanation of the pyrexia a reasonable one. The costal type of breathing which was noted was due to the implication of the phrenics by the rapid ascent of the morbid process; and it is likely that death was due, not to exhaustion, but to the implication of the respiratory nuclei in the lower medulla.

In certain respects the case here reported appears to be unique. In a fairly thorough search of the literature of new growths of the spinal cord we have been unable to find a case with similar pathological characters in an infant of one year, where the process has been so rapid in development and has been associated with hyperpyrexia referable to this process. The case which most closely resembles ours is one reported by Miura.[1] The patient was a boy, aged eight years, who developed paraplegia, partial paralysis of the arms, and loss of sensibility below the manubrium of the sternum. There was no fever. The entire duration of the symptoms was from four to five months. Death occurred suddenly and unexpectedly. A centrally situated glioma was found extending from the upper cervical region through the lumbar region of the cord.

It is clear from a comparison with the histology of this cord that the process closely resembles the one which we have described. The distribution of the paralysis and anæsthesia and the rapid course of the disease are clinical features of both cases. On the other hand, Miura's patient was eight years of age, and is said to have had no fever during his illness.

Cases that resemble the one we have reported are described by some writers as cases of central gliomatosis. Hoffmann,[2] in his recent study of syringomyelia, insists on our recognizing two classes of cases: first, those in which there is a slow hyperplasia of the neurogliar substance, usually with eventual cavity-formation and without any enlargement of the cord or increase of consistence; secondly, cases in which there is a rapid growth of neurogliar elements with little tendency to cavity-formation and with enlargement of the cord and increase in its consistence. To the first class of cases is given the name gliosis of the spinal cord. Most cases of syringomyelia which are diagnosed during life belong in this group. The name gliomatosis of the spinal cord is given to cases of the second class on the ground that these are really cases of glioma which have extended a considerable longitudinal distance in the cord. In addition to the case of Miura already mentioned, Hoffmann places in this class the following cases:

A case of Simon's,[3] in which there was paraplegia in a girl aged twenty years, due to a large myxo-glioma with cavity.

The case of Van Giesen,[4] in which there was paraplegia of gradual onset in a farmer, aged forty-seven years, due to telangiectatic glio-sarcoma with cavity, occupying a large part of the dorsal cord.

The case of Daxenberger,[5] in which there was paraplegia in a boy, aged seventeen years, due to a glioma which extended from the upper dorsal cord into the lumbar enlargement.

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[1] Ueber Gliom des Rückenmarks u. Syringomyelus. Ziegler's Beiträge zur pathol. Anatomie, Bd. xi. S. 91.

[2] Deutsche Zeitschrift für Nervenheilkunde, 3 Bd. Heft 1 and 2, 1892.

[3] Simon: Arch. für Psychiatrie, Bd. v. p. 120.

[4] Van Giesen: Report of a Case of Syringomyelia, Journal of Nervous and Mental Disease, 1889.

[5] Daxenberger: Ueber Gliombildung und Syringomyelia, Erlanger Dissertation, 1890.

The case of Seebohm,[1] in which paralysis of the legs and partial paralysis of the arms, with anæsthesia, in a man aged thirty years, were due to a spindle celled sarcoma with cavity, extending from the medulla into the lumbar enlargement.

The case of Schultze,[2] in which a Brown-Séquard paralysis with bulbar symptoms was due to a telangiectatic myxomatous glio-sarcoma extending from the medulla to the conus medullaris.

The case of Sokoloff,[3] in which a boy, aged five years, developed paralysis and atrophy in the arms and sensory disturbances in the left leg, referable to a glioma of the medulla with cavity-formation, which extended to the lower cervical region.

Although these cases, cited by Hoffmann, seem to resemble the case we have reported in their histological features, they differ from it clinically in not running such a rapid course. But, although these cases did not run an extremely rapid course, most of them died in the course of two years from the time when symptoms were first noted; and none of them lived more than three years, a common feature which is in marked contrast to the majority of cases that are described as syringomyelia. According to Hoffmann, there are pathological as well as clinical differences between cases of gliosis and gliomatosis.

Histologically, the cases of gliomatosis differ from those of gliosis in their richness in new cell-elements and their poverty in neuroglia cell-processes. Further, they differ in the greater tendency to cavity-formation which is noted in the cases of gliosis. But we cannot agree with Hoffmann that these differences necessitate the nomenclature which he employs. We believe, from study of preparations and reports of cases, that there is no essential pathological difference between the process described as gliosis and that described as gliomatosis. It is true that we may pick out cases, on the one hand, in which new cell-elements are scanty and neuroglia processes are very abundant, and in which the cord is normal in size; and, on the other hand, cases where the new cell-elements are abundant and varied, with few neuroglia fibres, and the cord is increased in size and consistence. We have, however, no intimate knowledge of the nature of these processes which justifies us in separating them on pathogenetic grounds. We do know that between the extremes of these types there are all gradations; and we have reason to believe that the process of cell-multiplication begins in both cases from the ependymal and peri-ependymal cells. On pathological grounds, therefore, we are hardly justified in making even the separation into groups which is implied by the use of the term gliosis and gliomatosis. It is proper to add, however, that Weigert and others distinguish sharply between these types on pathological grounds.

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[1] Seebohm: Ueber einen Falle nn Tumor der medulla spinilis Mit Syringomyelia, Stranberger Dissertation, 1888.

[2] Schultze: Arch. für Psychiatrie, Bd. viii. p. 367; also Bd. lxxxvii. p. 510, and Bd. cii. p. 435.

[3] Sokoloff: Levei Fälle von Gliom des Centralnervensystem, Arch. f. klin. Medicine, Bd. xli.

On clinical grounds a separation into groups is desirable and even necessary. The difference in progress between the extreme cases of the two types mentioned is very striking, and this entails a certain difference in the character of the symptoms; for the rapid cases are much more apt to be associated with irritative symptoms, such as pain, hyperalgesia, and rigidity, than are the cases of slow growth. In view of these facts it seems reasonable to class cases according to the rate of their progress, as cases of slow gliosis of the spinal cord on the one hand, and of rapid gliosis of the spinal cord on the other. The term gliosis is as applicable to the one set as to the other. The term gliomatosis is objectionable for the reasons above mentioned. Inasmuch as there are probably all gradations between the extremes of each type, there must necessarily be some diversity as to usage, by different persons, of the terms we have proposed. In our opinion all cases which run their course inside of two years should be classed as rapid cases. The presence or absence of a cavity is of no significance in connection with the proposed classification. It is said that cavities are less apt to occur in the rapid than in the slow cases of gliosis, and this is probably true; although it would be reasonable to expect a rapid rich-celled growth to undergo the degenerative changes which are the usual cause of the cavity-formation more regularly than a slower growth with fewer cell-elements. In our own case and in that of Miura there was no cavity-formation. It is, however, clear from the advanced degenerative changes in the neuroglia cells in certain parts of the cord which we have described that the conditions were favorable to cavity-formation, and this would probably have occurred had the degenerative process gone on a little further. Thus it may be that the rapidly fatal termination of certain cases is the chief reason why cavities are not oftener observed in them.

The majority of cases to which the word syringomyelia is applied are cases of slow gliosis of the spinal cord, and should be designated as such. If there is reason to suspect the presence of a cavity in a given case, the word syringomyelia may be added for qualification, so that the diagnosis would read, slow gliosis of the spinal cord with syringomyelia. In most cases it is impossible to say from the symptoms whether a cavity is or is not present, and the term syringomyelia has occupied far too conspicuous a place in our vocabulary.

It is to be noted that there were no secondary degenerations, ascending or descending, in the cord which we have described. At first sight this is a surprise, for the white tracts are entirely interrupted in the cervical region. But it is probable that this complete interruption was of short duration and that there was insufficient time for the development of secondary degeneration. It is remarkable how often one fails to find secondary degeneration in the spinal cord in cases of tumor where the conditions seem adequate to cause it.

In conclusion, it is of interest to touch on some of the difficulties in the diagnosis of cases like the one we have described. The cervical paraplegia, the spasm of the muscles of the neck, the prominence of the fourth cervical vertebra led to the diagnosis of Pott's disease by several competent-observers. This view of the case was strengthened by what seemed likely to be the signs of a tubercular process in the lungs and by the presence of fever. It soon became clear, however, that the fever was too high to be accounted for by the evidences of disease in the chest, and that it was probably the result of rapid damage to the cervical cord. The prominence of the fourth cervical vertebra did not appear to be associated with any abnormality of the bone, and was a misleading factor in the diagnosis.

It must be owned that the diagnosis was a difficult one to make, and we are unable at present to make a satisfactory statement of the features in which the diagnosis of such cases as these from Pott's can be made with any degree of confidence. Both Pott's and gliosis of the cord are so rare at this time of life that we have not as yet the material for formulating such points of clinical difference as may exist.

THE PHYSICAL SIGNS OF CELLULAR ŒDEMA OF THE LUNG, CONSIDERED IN THEIR RELATION TO THE PATHOLOGICAL CHANGES.[1]

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In the year 1886 I drew the attention of the Medico-Chirurgical Society of St. Louis to a form of disease of the upper air-passages and the lung that developed a history and symptoms entirely foreign to those forms of disease known in that locality. The typical form of throat disease was a solid œdema of the mucous membrane, and the pulmonary affection showed varying degrees of consolidation or infiltration of the lungs.

In the pulmonary form of the disease the mortality was very great, far exceeding the ordinary forms of pneumonia. The symptomatic history of the disease was an unusual one, and the combination of the physical signs in the different cases was at once contradictory and perplexing, resembling, in certain cases, a croupous pneumonia, in others a bronchial pneumonia or bronchitis. Still the symptoms and the physical signs were at variance with those which are usually recognized as peculiar to these conditions.

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[1] Read before the Eleventh Annual Meeting of the American Climatological Society.

In 1887 I began the study of the post-mortem appearance of these lungs, and published a report of the throat cases in a paper read before the American Laryngological Society, in June, 1889 (*New York Medical Journal*, August 16, 1889); also, one on the lung affection in March, 1890 (AMERICAN JOURNAL OF THE MEDICAL SCIENCES).

In this paper I drew attention to the peculiar cell-infiltration of the lungs, and claimed that this condition was the local effect of a general septic infection of the system. As the symptoms of the disease bear a striking resemblance to the symptoms of the influenza as described by Graves, or la grippe, of Valliex, I surmised that these might be cases of influenza. The history of 1890, 1891, and 1892, with the prevailing epidemic, proved the correctness of this view, and the cases may now be recognized simply as sporadic cases of influenza, which preceded the epidemic by several years, in the same way that sporadic cases have followed it, to the present time. My studies of this disease have been chiefly clinical, aided by the macroscopic appearance in the dead-house and microscopic sections. The limited bacteriological study that has been made for me has shown the streptococcus to be the prevailing micro-organism.

Cellular œdema of the lung has been generally called in this country the grippe pneumonia. I would consider the name "pneumonia" as improper, as only a certain number of the cases bear a resemblance to a bronchial pneumonia, and the existence of inflammatory action is very uncertain. I would consider it to be essentially an œdema of the lung in which the cell-elements, largely leucocytes, are poured out very quickly, in greater or less numbers, from the lymph and bloodvessels, producing a partial or complete infiltration of the lung. The fever and other symptoms which occur in the disease I believe to be strictly dependent upon the sepsis, and the symptoms and the amount of the infiltration of the lung will be determined by the intensity of the streptococcus poisoning. That this condition of the lung is only the local expression of a general systemic disturbance will be seen from the changes in the other organs. In fatal cases there is some change in the liver; it is usually enlarged and softened: the spleen is pulpy, giving the appearance of a septic spleen; and the heart-muscles are in many cases so softened that they can be readily torn: the kidneys are generally hyperæmic.

This conclusion is the result of a study of thirty-four post-mortem examinations made between the years 1886 and 1894. In twenty-one of these the typical appearance of the lung was alone present. In thirteen it was complicated with other conditions. On the post-mortem table the lung, in a condition of cellular œdema, presents a swollen, congested appearance. It is generally brown-black in color, and interspersed over the lungs are areas of a lighter brown or gray. These areas may be of limited extent or they may include the greater part of the lobe. The boundaries are irregular and they are scattered over different portions of the lung. If we take up a portion which is brown black in appearance, we will find that on pressure it crepitates with difficulty. The crepitation is apparent, but the "feel" of the lung presents a degree of solidity foreign to healthy lung tissue, and the crepitation is produced only with more pressure. When placed in water it quickly rises to the surface. The cut surface is smooth and moist. If this section of the lung is placed under the microscope, it will be seen that the alveolar walls are infiltrated with numerous cell-elements, but the interior of the air-vesicles remains free. The physical signs of a lung in this condition are such that they can be fully explained by the pathological conditions. To the inspiratory sound is wanting the free flowing breath-sound of normal lung expansion. The lungs seem to be extended with decided effort, and the inspiratory sound is delayed and prolonged. In quality the sound may be slightly harsher than the pure vesicular breathing. No change, or only a slight lengthening of the expiratory sound, is apparent. The percussion-sound may be so slightly changed as to appear normal, or show only a slight shortening of the normal resonance.

Another area of the lung presents a dark-brown color. To the hand this gives a feeling of solidity. When cut it appears as a solid substance, like a piece of beef. There are no crepitations on pressure, but when placed in water it floats on the surface. Examined under the microscope we find the alveolar walls densely infiltrated with cell-elements, with a partial filling of the vesicles. Some of the vesicles are more filled than others, but in the greater part we recognize the existence of air-spaces. The amount of infiltration varies in different sections and portions of the sections, but the presence of a large number of partially filled vesicles may be recognized in all. In a cut section of the bronchus the walls may be seen thickened by the same cell-elements.

The physical signs produced by this condition of the lung depend largely upon the amount and extent of the infiltration of the bronchial mucous membrane, together with the partial infiltration of the vesicles. The percussion-sound is always deadened, giving to the finger an increased sense of resistance. In minor degrees of infiltration through the deadened sound a slight degree of pulmonary resistance may be appreciated. When the infiltration is greater we find the percussion-sound very dull; even there may be a perfect flatness. In some cases we find an exaggerated full percussion-sound, such as we find in emphysema, and it may be even tympanitic in character; but even if this is the case, the sense of resistance is still always somewhat increased. It is difficult to explain this resonance of the percussion-sound under such conditions, and we can only believe that it is either due to the confined air in the vesicles, through the complete obstruction of the bronchii, or it may be the result of some gas-producing micro-organism which it has been claimed has been found in these lungs. Occasionally we find an interchangeability between the dull percussion-sound and the exaggerated resonance. The same place may be dull to-day and to-morrow may be hyper-resonant, and this may again be replaced by dulness.

The auscultatory signs of this degree of cellular œdema are very perplexing and contradictory. In cases where the œdema of the bronchial mucous membrane is sufficient to thicken the membrane, rendering it dry, we find the normal respiratory murmur changed into a harsh respiration, in which the inspiratory sound is lengthened, sharp, and of a high pitch, and it is immediately followed by a prolonged expiration of lower pitch. In some cases the expiratory sound is absent, and the prolonged harsh inspiration is alone heard. In cases where the œdema narrows the bronchii to a still greater degree we shall have the sibilant râles. They may be inspiratory or expiratory, or both. They resemble asthmatic râles in a measure, but they are shorter in time, the inspiratory râle rarely covering the whole time of the inspiratory act; a distinct interval of silence may or may not be followed by the expiratory râle. Occasionally we will have large-sized sub-crepitant râles, largely expiratory. They resemble dry crackling sounds, and are probably formed by the passage of the air through the viscid secretion of the bronchii. The dry and the moist râles are not, as a rule, continuous phenomena: they vary from day to day, and may entirely disappear for a time, to be again heard in varying degrees of intensity.

Where the œdema is so great that it completely occludes the bronchii we will find a complete silence over the lung. This silence is even greater than that formed over pleuritic effusion, where more or less distinct breathing may often be heard. Vocal and pectoral fremitus is wanting. This silence of the lung may continue for an hour or for weeks. It may be broken, first, by a gush of mucous râles, which can be heard during the inspiration. These râles may again disappear, and no respiratory sound may be heard. Later, they have a tendency to become permanent, and may continue as large-sized inspiratory râles for months. In other cases we have a gradual return to normal breathing without any appreciable râles.

The portions of the lungs which are of light brown, or which may appear as steel-gray, give all the evidences of a consolidated lung. They are dense and firm. The cut surface is dry, smooth, and glistening, and, when placed in water, sinks instantly. Under the microscope we find the alveolar walls and the vesicles densely filled with the cell-elements. The physical signs of this condition are the ordinary signs of consolidation (bronchial breathing and increased pectoral and vocal fremitus). The percussion-sound is slightly flat. Occasionally the bronchial breathing is replaced by amphoric breathing. This was true where, on the post-mortem, the apex of the lung was of a light-gray color and completely consolidated. The tendency of this consolidation is to continue for a long time. It remains after all the other portions of the lung have become normal. The disappearance of the abnormal signs and the reappearance of healthy lung action is gradual. Cellular œdema of the lung seems to present a most fertile soil for the growth and development of the tubercle bacillus, and I believe we find here the origin of a large number of our present cases of acquired tuberculosis.

Occasionally we find signs of cavities. On post-mortem examination we find the cavities to be irregular in form, with soft walls, giving the appearance as if they were worm-eaten, with an entire absence of the fibroid tissue which is usually seen about tubercular cavities.

I would describe the different degrees of infiltration as types and not as stages of the disease, for I have not found them to merge from one into the other. A type which occurs in the beginning in a certain portion of the lung continues throughout the attack. The infiltration is sudden, and resolution may occur as quickly.

NOTE.—The treatment of *cellular œdema* of the lung which has given excellent results in the hands of the writer may be thus summarized: Fifteen to twenty grain doses of benzoate of sodium with half-drachm doses of solution of acetate of ammonium should be given every two hours. In addition, twenty-five drops of the muriated tincture of iron should be taken every four hours. Whiskey or champagne may be given freely, and digitalis is almost always required through the whole course of the disease. Frequent counter-irritation over the lung is desirable.

DANGEROUS CONDENSED MILK.

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DURING the course of the past summer attention was called to the sale of cans of condensed milk, with spoiled and possibly dangerous contents, and some sensational articles were published in the newspapers. I was subsequently requested by the local and State Boards of Health to investigate the matter, specimen cans of each brand at that time in the market being collected by inspectors and submitted to me for examination. A much more satisfactory inquiry could have been made had the inspectors ransacked the retail grocery stores and collected cans showing age or distention; but all the specimens which came to me were outwardly in good condition. I had no means of ascertaining their age.

The contents of the cans in most cases had the ordinary smell of condensed milk, and were neutral or nearly so to test-paper; others were faintly acid, and one strongly so. The last had thickened into a mass with the smell, taste, and consistency of some variety of soft cheese.

I give below a table, with description of each brand, and in another table the composition. In order to find the number of times the original milk has been condensed I have divided the percentage of milk solids (*i. e.*, the total solids less the added cane-sugar) by 12.5. This is done on the assumption that the average amount of solids in ordinary whole milk is represented by this figure. The quotient divided into the percentage of fat in the condensed milk gives the percentage of fat in the original milk before condensation.

TABLE I.—MILK CONDENSED WITH CANE-SUGAR.

Brand.	Color-tint.	Taste.	Odor.	Reaction.
Tip Top,	Reddish-brown.	Very sweet.	Normal.	Very slightly acid.
Eagle,	Yellowish-brown.	Sweet and pleasant.	Normal.	Nearly neutral.
Champion,	Yellowish-brown.	Sweet and dry.	Normal.	Nearly neutral.
Daisy,	Brownish-white.	Sweet and dry.	Normal.	Nearly neutral.
Full Weight,	Yellowish-brown.	Sweet.	Normal.	Neutral.
Sweet Clover,	Light yellowish-brown.	Sweet.	Normal.	Nearly neutral.
Challenge,	Dark yellowish-brown.	Sweet.	Normal.	Neutral.
Magnolia,	Nearly white.	Cheesy.	Cheesy.	Acid.
C. and S.	Yellowish-brown.	Sweet.	Normal	Neutral.
Atlas,	Yellowish-brown.	Sweet and pleasant.	Like whole milk.	Slightly acid.
Leader,	Light brownish-white.	Sweet.	Normal.	Slightly acid.
Standard,	Brownish-white.	Sweet.	Normal.	Nearly neutral.
Winner,	Reddish-brown.	Buttery.	Faint cheesy.	Nearly neutral.
Bell,	Yellowish-brown.	Sweet and pleasant.	Normal.	Nearly neutral.
Red Cross,	Brownish-white.	Sweet, unpleasant.	Unpleasant.	Slightly acid.

I have taken the number 12.5 as representing the average total solids, because the State of New Jersey makes the legal standard 12 per cent., while other States enact 13. The last number represents very nearly the true average, but at the same time so much of the milk of particular cows, or particular breeds of cows, falls below this figure that I think the legal standard should properly be made 12.5 per cent.

In the process of condensation the tint of color natural to milk is, of course, somewhat intensified; but, in addition, some of the samples have quite a decided brownish tinge. This is due to a change in the fat. After extraction with ether the fat obtained in the process of analysis from condensed milk frequently has a tint of brownish-yellow, while the fat similarly obtained from ordinary milk is colorless or faint yellow.

This change is of a character unfavorable to the use of such condensed milk in infant-feeding.

TABLE II.—MILK CONDENSED WITH CANE-SUGAR.

Brand.	Percentages.								Times condensed.
	Water.	Fat.	Caseine and albumin.	Milk-sugar.	Ash.	Cane-sugar.	Milk solids.	Fat in original milk.	
Tip Top	26.00	10.17	9.22	11.37	1.99	41.25	32.75	3.88	2.62
Eagle	28.32	9.11	9.06	10.11	1.91	41.49	30.19	3.78	2.41
Champion . . .	27.72	9.60	9.52	10.11	1.83	41.22	31.06	3.87	2.48
Daisy	25.53	9.41	8.71	13.43	1.83	41.09	33.38	3.52	2.67
Full Weight . .	28.18	9.00	7.87	11.70	1.88	41.37	30.45	3.70	2.43
Sweet Clover . .	28.70	10.30	8.47	11.31	1.83	39.39	31.91	4.17	2.47
Challenge . . .	28.44	9.86	8.99	10.05	1.82	40.84	30.72	4.04	2.45
Magnolia . . .	30.04	9.48	8.17	12.81	1.91	37.59	32.37	3.66	2.59
C. and S. . . .	26.99	9.11	8.68	16.98	2.15	36.09	36.92	3.09	2.95
Atlas	28.30	7.64	10.91	10.79	1.83	40.53	31.17	3.06	2.49
Leader	28.20	8.02	8.01	11.32	1.80	42.65	29.15	3.44	2.33
Standard . . .	27.21	7.79	8.21	13.30	1.85	41.64	31.15	3.12	2.49
Winner	29.84	9.63	9.82	11.17	1.98	37.56	32.60	3.70	2.60
Bell	25.54	12.13	8.87	10.51	2.05	40.90	33.56	4.52	2.68
Red Cross . . .	29.34	8.80	7.81	10.00	1.76	42.29	28.37	3.87	2.27
Average . .	27.89	8.67	8.82	11.66	1.83	40.39	31.71	3.69	2.52

On an average, 55 per cent. of the solid matters is cane-sugar. This, of course, imparts excessive sweetness, which renders infants fond of such milk and impatient when a change to an unsweetened diet is attempted. There is, in addition, a certain dry or even gritty taste in some samples. This is due to the milk-sugar, which being sparingly soluble, requiring from five to six parts of cold water to dissolve it, begins to crystallize out. It forms minute, hard, white, transparent crystals. This grittiness sometimes originates a prejudice, being attributed to some impurity, and to overcome this false notion some of the labels call attention to the gritty taste, and state that inasmuch as it is due to the presence of milk-sugar it is positive proof of the purity of the fresh milk used in manufacture. Of course, this is an overstatement, since the milk might be impure and yet all of its milk-sugar might be present.

The most important change is that which sometimes results in producing condensed milk of a slimy, cheesy, or semi-solid character. Such milk, in the course of time, may even become quite solid, or "go hard," to employ the term familiarly used in the trade; or it may undergo putrefaction, liberating gases which distend or burst the can.

These changes are due to specific bacterial ferments getting into the milk before the process of condensation. What most concerns us here are not the description and characters of these organisms, but the circumstances under which they get into the milk and the effect they produce.

Of those, for instance, which produce the slimy fermentation at least six species are known. They are not found in pure milk, and are not met with when the feed and fodder of the cattle, the barn and dairy, the milk-pails, utensils of every sort, and the toilet both of the cows and men are truly clean. The same remark applies to the entrance of all other fermentative and putrefactive bacteria.

Some cannot be avoided, but their multiplication can be minimized by careful handling of the milk prior to condensation, and particularly by its immediate cooling to a temperature as near 32° as practicable. Inspectors now forbid the marketing of milk for domestic use without such cooling immediately after milking, but the equal importance of so doing before condensation is not yet generally recognized. In the interim before cooling ptomaines in the nature of tyrotoxicon are generated, and act as more or less acute poisons.

Fortunately the interests of the public coincide with those of the manufacturers in most respects, and, apart from the propriety of its use for infant-nutrition, much can be said in praise of the great value of condensed mild as a manufactured product. It would be a great loss to the canner were he to use or purchase watered milk, since the chief expense is the evaporation of the water. And dairymen dishonest enough to water milk are also those most likely to have impure wells, improper food, and unclean surroundings. Not from added water, but only, in the case of condensed milk, from water used in washing utensils and in handling is danger to be dreaded. The evidence of the analysis shows that it is the usual practice to use unskimmed milk. It would be against the interests of the manufacturer to use impure or colored sugar, since these impurities in an article which forms the chief constituent of the food, and which can be bought in a pure condition at a low price, would produce a dark-colored, unsalable product.

And the same remark is true of the original milk itself. It is out of the question for the canner to employ a bacteriologist to examine the milk used, and the hardening and putrefactive changes which the condensed milk sometimes undergoes are usually due to failures in cleanliness, etc., at the dairy. Later on, the canner will participate with the public in the great benefits of a rigid system of inspection that will, first of all, begin with the dairy and the cattle themselves.

As things are at present, the manufacturer frequently has hundreds of cans which spoil in time on the shelves of the grocers from the causes mentioned. A small amount of contaminated milk contaminates all the rest used with it, and the results are not manifest until the goods are in the hands of the dealers. The canner is compelled to take them back very frequently, and often is most anxious to do so. Much of the residue is rejected by consumers as manifestly unfit for use, and so the dangerous and poisonous part is very small as compared with the total enormous output.

In this article I have avoided saying anything in relation to the effects on the health of children resulting from the use of milk containing more than half its weight in solid matter of cane-sugar—a foreign fermentescible substance. Nor in relation to the impossibility of preparing from such an article a modified milk, or humanized milk, which is comparable to woman's milk, or even feebly approaches it, in nutritive value.

These latter objections do not apply to the milk condensed without the addition of cane-sugar. But even more care should be used to see that the milk thus condensed is kept free from the products of bacterial action in the interval between milking and canning. And inasmuch as cane-sugar acts as a preservative, milk condensed without it is more susceptible to change and more apt to act upon the metal of the can than when cane-sugar is present. For these reasons it would be better were it preserved in glass bottles rather than in tin cans.

A CASE OF ANUS VULVALIS, WITH REMARKS ON CONGENITAL COMMUNICATION OF THE VULVA AND RECTUM.

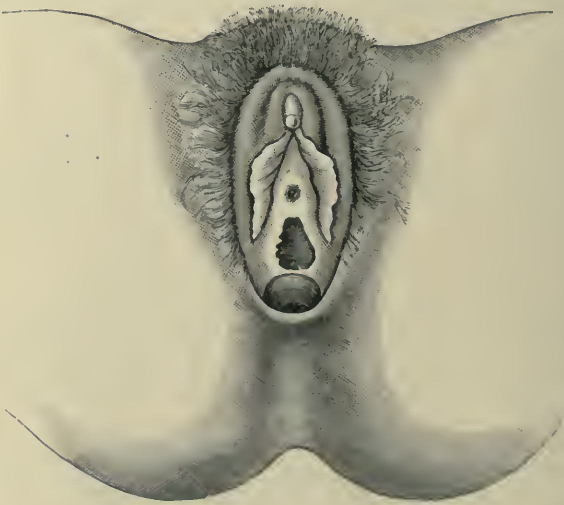
By Thomas Dwight, M.D.,
PARKMAN PROFESSOR OF ANATOMY AT HARVARD UNIVERSITY.

The following observation was made at the Harvard Medical School in March, 1894, on the body of a well-formed white woman, aged thirty-two years, apparently a virgin:

There was no anus, but the rectum opened into the vulva just above the posterior commissure by an orifice which would admit a large finger. The vulva was otherwise quite normal except that the hymen was poorly developed. It consisted of merely a slight fold above and at the sides; in fact it was quite indefinite. There certainly were no carunculæ myrtiformes. No depression or suggestion of the place of the normal anus was detected before dissection, though carefully looked for, but after the parts had been removed from the body there was a distinct puckering of the skin about 2.5 cm. back of the vulva. There was no irritation of the skin about the vulva indicating incontinence of feces, nor was this observed during the three weeks the woman passed at the almshouse before her death.

It was, unfortunately, impossible to dissect the parts very thoroughly without destroying the specimen, but the following facts were observed. The rectum was smaller than usual. It ran from the tip of the coccyx along the floor of the pelvis, continuing tubular to the last, without a well-marked dilatation. The longitudinal muscular fibres seemed uncommonly developed. Although the woman was not fat, it might have required an incision three quarters of an inch in depth to reach the gut from the puckered point. No sphincter could be detected at the termination of the rectum. The vagina was normal, and capacious above the entrance. The levator ani was very strong.

Cases of *anus vulvo-vaginalis*, as they are commonly called, are very rare, especially in the adult. Ahlfeld,[1] who uses this term, referring to Schröder's contention that the rectum never opens into the vagina proper, asserts that it does so, and that there may be a communication between the two, even when there is a normal anus. He goes on to say that the term *vaginalis* alone should be restricted to those cases in which the opening is evidently into the vagina and not in the region of the hymen and vulva. As the opening is usually nearly in the situation observed in this case, the term *vulvalis* seems the proper one. A tolerably thorough review of the literature allows the following statements: Almost all the cases reported are those of infants. Many of these were successfully operated upon. The relatively small number observed in the adult implies that most of the infants either die or are successfully operated upon. Deutsh[2] reported the case of a woman of twenty-nine, with the rectum opening into the vulva below the hymen. There was a small pea-like appendage at the normal place for the anus, which felt like cartilage covered with skin. Dr. Henry Tuck[3] recorded the very interesting case of an American woman of twenty-six whom he attended in her confinement. A depression was felt at the normal site of the anus where the skin was deeply pigmented. The rectum opened about half an inch above the posterior commissure. It was closed by a sphincter, though rather a lax one.



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[1] Die Missbildungen des Menschen.

[2] Neue Zeitschrift für Geburtshülfe, Bd. xxx. I have not seen the original.

[3] Boston Medical and Surgical Journal, 1876.

The patient had never had any difficulty in retaining the feces. In most of the children the normal position of the anus was to be recognized by a depression; but this was not constant. The size and shape of the opening into the vulva are various. It may be a mere pinhole and it may be valvular. Tuck is, I believe, almost the only one who speaks of a sphincter. The rectum seems usually to run along the floor of the pelvis, which is important in view of an operation for artificial anus. Provided the opening is sufficiently large for proper evacuations an operation is not imperative should the child's condition be unfavorable. This case as well as Tuck's shows that there need be no incontinence of feces. They give additional evidence that the feces accumulate in the sigmoid flexure. In a few cases there was more or less duplication of the internal organs.[1]

Most of the cases in which the rectum communicates with the vagina proper are those in which there is a double vagina and also a normal anus. The case to which Ahlfeld refers in his above-mentioned controversy with Schröder is that of Joseph,[2] who found in the body of a girl, three years old, in which both vulva and anus were normal, a double vagina, of which the smaller communicated with the rectum. The following remarkable case was observed by Caradec[3] on a living woman, aged thirty-two years. The anus and vulva were normal, except that the latter was rather shorter than usual, and the vagina was small. Between them was a third, slightly oval opening, 1.5 cm. before the anus, its longest diameter being antero-posterior. This led into a cul-de-sac lined with mucous membrane, which at its entrance offered a certain resistance, as of a sphincter. The anterior wall between it and the vagina was thicker above than below; the posterior wall, on the contrary, was thinner higher up and presented a fistulous opening large enough to admit a finger, which entered the rectum at least 5 cm. from the anus. The woman had suffered no inconvenience till after her marriage, when feces and flatus began to pass by the middle opening. Presumably this passage is to be called, as Caradec believes, a second vagina.

Finally there are excessively rare cases presenting a normal anus and an opening of the rectum into the vulva which is unsuspected during virginity. They are very important from a medico-legal point of view. There is no doubt in my mind that the remarkable case which follows is of this nature. It was seen by E. Springfeld.[1] Shortly after marriage a woman of about thirty began to have feces pass by the vagina. Coitus was at first intensely painful and followed by moderate bleeding. The bridegroom had been drinking rather freely, but was not drunk. When the woman submitted to examination, which was a long time afterward, the place of the *fossa navicularis* was taken by an opening, a little more on the right than on the left, slightly patulous, admitting easily two fingers into the rectum. The borders were smooth, but an epithelial covering was not to be made out.

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[1] Since this paper was sent to THE JOURNAL an article by Dr. A. H. Buckmaster has appeared in the Transactions of the American Gynecological Society, vol. xix., 1894. In it he enumerates fifty-one cases besides that of his patient. Of these, fourteen were adults, including one aged sixteen. I was not acquainted with several of these cases; but, curiously enough, the list does not contain any of those I have mentioned. Though I do not speak by the book, I incline to think that the list could be considerably increased, perhaps nearly doubled. Of the fourteen adults it seems reasonably certain that six had control of the feces. The contrary is definitely stated only once. Probably the more happy condition is the rule.

[2] Beiträge zur Geburtshülfe und Gynäkologie, Bd. iii.

[3] Gazette des Hôpitaux, 1863.

Before discussing the case it will be best to mention another, which, in this connection, is very instructive. Paul Reichel[2] operated on a multipara, aged twenty-five years, who since her marriage, three years before, had suffered from the escape of feces *per vaginam*.[3] The anus was normal, but the perineum was short, and the posterior part of the vulva abnormally deep. An opening large enough to admit a finger into the rectum was found just below the place for the hymen. The edges, except for some granulating fissures and scars, were covered with mucous membrane. There was no history of any injury or undue violence. Beyond question this opening was congenital. It was in the usual place for *anus vulvalis*, differing only from a typical case by the presence of a normal anus. The nature of the mucous membrane at the opening is conclusive. The preceding case, that reported by Springfeld, is of the same class. The position of the opening is the same, only its edges, which presumably suffered more violence, show somewhat less conclusively a continuous mucous membrane passing from the vulva into the rectum. It is not credible that this injury was done by the male organ to a normally built woman. Those who have learned the anatomy of the female perineum either on the living or by the study of frozen sections, know that the perineal body interposed between the rectum and the vulva makes such a perforation impossible. The only difficulty is to explain why no feces escaped the wrong way before marriage. It is possible that the opening was valvular, or guarded by a slight sphincter. It is also possible that there was no opening at all, but merely a thin septum, the imperfect correction of an early malformation which easily gave way. Springfeld seems to consider this explanation not unlikely. Be that as it may for his case, it does not apply to Reichel's. The true explanation in my opinion is the close apposition of the parts in a virgin, maintained partly by muscular tonicity, partly by the support of vascular structures.

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[1] Vierteljahresschrift für Gerichtliche Medicin, etc., Bd. l., 1889.

[2] Zeitschrift für Geburtshülfe und Gynäkologie, Bd. xlv., 1888.

[3] As elsewhere, the word "vagina" is here used inaccurately.

REVIEWS.

CHIRURGIE OPÉRATOIRE DU SYSTÈME NERVEUX. Par A. CHIPAULT. Avec une Préface De M. Le Professeur Terrier. Tome Premier, Chirurgie Cranio-Cérébrale. Avec 431 figures dont 209 en couleurs. 8vo., pp. xx. and 744. Tome second, Chirurgie de la Moelle et des Nerfs. Avec 432 figures dont 365 en couleurs. Pp. 800. Paris: Reuff et Cie, 1894 and 1895.

OPERATIVE SURGERY OF THE NERVOUS SYSTEM. By A. CHIPAULT.

THE present work, when finished, will be the only complete work, we believe, on operative surgery of the entire nervous system, central and peripheral, in any language. The present part, the Surgery of the Head, Spine, and Nerves, consists of two volumes, that of the Surgery of the Spine (of which one volume has been published) of three or four volumes, the two parts supplementing each other very admirably. The author does not treat, of course, of those topics in general surgery which find a certain application to disorders of the nervous system, such as ligation of the carotid for cerebral hemorrhage, aneurism, or epilepsy, or treatment of nervous disorders by removal of the uterine appendages, etc.

The illustrations are very large in number (863), and, as a rule, admirable in quality, though many are rather rough outlines. One very striking point about them is that nearly all of them, even those which are adapted from other authors, are drawn by the author himself, showing that he is as skilful with his pencil as he is with his pen or his scalpel. The illustrations really illustrate. They show the development of the various instruments for cerebral surgery from the earliest days, including reproductions from some of the surgeries of the sixteenth century. One from Andrea a Cruce illustrates very curiously the condition of housekeeping at such a time. While the surgeon is in the midst of his operation of trephining the skull, and the ladies of the family are looking on, a cat in the corner has evidently just caught a rat, and is playing with it. Many of the illustrations are in colors, which make them more effective as well as attractive.

All of the important methods of cerebral localization are well illustrated and fully described in the text. As was observed in our former notice of the author's Surgery of the Spine (AMERICAN JOURNAL OF THE MEDICAL SCIENCES, March, 1894), the text of this volume also shows an exceedingly laborious and fruitful research in all languages and countries. There is no national pride which restricts his researches to thé publications of his own countrymen, but he has drawn very freely from English, German, and American sources. In fact, no publication seems to be too obscure for him to have sought it out and recorded the results.

Under each important subject, such as intra-cranial tumors, osteoplastic resection, thrombosis of the lateral sinuses, laminectomy, resection of the fifth and of the facial nerves, etc., there are very complete tables of all cases of surgical intervention, with the sources from which they are derived. Besides this, at the end of each chapter is an extremely full and complete bibliography. These features will make this book necessarily a source from which subsequent authors will derive the greatest possible help in their investigations.

At the end of the second volume there are full indexes of authors and an index of subjects which could have been greatly elaborated with advantage. Our French *confrères*, however, so seldom have *any* index, that we welcome this happy innovation, and hope others of his countrymen will follow his example.

Turning now to the text (to which space will allow only too brief a reference) the introduction deals with antisepsis, shock, and anæsthesia in the surgery of the nervous system. In these matters the author is fully in accord with the most advanced modern surgeons. He notes the observation of Dercum, that the frequency and intensity of shock become greater in proportion as we pass from the anterior brain toward the posterior, and thence toward the base and the cord. He states his disagreement with this general law, according to which interference with the spinal cord should be more dangerous than intervention in any other part of the nervous system. His belief, which is corroborated both by his figures and, we believe, by the general opinion of surgeons is, that this law is only true when restricted to the encephalon alone. Certainly, in our own experience, intervention in cases of spinal disease is much less dangerous than any equally serious intervention in diseases of the brain.

The author's statistics are also very striking. Analyzing 802 operations on the brain and cord, he finds that in operations on the anterior lobes (60 cases) the mortality is 1 to 60; in the convexity of the cortex (400 cases) 1 to 13; at the base (51 cases) 1 to 5; and in the cerebellum (37 cases) 1 to 3; whereas in the spine (117 cases) it is 1 to 17. It seems to us very natural that the shock should increase as we go from the anterior pole of the encephalon toward the base, because at the base and in the medulla oblongata lie those important centres for organic life, any lesion of which is excessively perilous—much more so than of those on the upper portions of the encephalon, which have to do with intellection, motion, and sensation. In 420 cases the percentage of mortality is identical in anæsthesia with ether, chloroform, or a combination of both.

In Chapter II., the Topography of the Brain, the methods of locating the fissures of Rolando and of Sylvius and the position of the middle meningeal artery are given very fully, together with such modifications as he thinks best.

The Wagner-Wolff method of osteoplastic trephining, together with the methods of filling a gap in the skull by celluloid or other foreign substances, and Koenig's method by chiselling the outer table away with the flap of scalp, are all noticed fully and illustrated, so that any surgeon can make himself familiar with the technique. Many cases also are quoted under this section and the next.

The only errors that we have noticed in the book occur here. The aluminum probe of Fluhrer on pages 273, 275, 285, and 292, and in the index appears as the probe of "Pflüger." On pages 302 and 303 a case, which is properly credited to Mills and Keen in the table on page 349, is erroneously credited to Lloyd and Deaver; and on page 336, Case 24 is credited to Dercum and Heath, instead of Hearn.

The table of intra-cranial tumors which have been removed shows encouraging results. In 67 cases there were 47 recoveries, or 70 per cent. This shows that we have made distinct progress in the treatment of cerebral tumors, the mortality of former tables having been much larger than is shown by this more extensive table. *Per contra,* in exploratory operations in which either the tumor was not found, or being found was irremovable, there were 35 deaths in 47 cases, a mortality of nearly 75 per cent. This is due, doubtless, to the extensive interference with the brain which has often been practised in order to search for the tumor or to remove an inoperable one. Another important surgical lesson is that while the post mortem findings in cases of cerebral tumors would seem to show that perhaps not over 6 to 10 per cent. are operable, yet of 115 cases actually tabulated in 67 the tumor was found and removed. Of course, no case would be operated on which was not deemed possibly operable, which would explain to some extent the discrepancy between the surgical and the pathological findings.

The methods of operation on the ventricles of the brain are fully described, and the reviewer's paper of 1888 is credited with establishing the technique of the operation which has found a much wider and more beneficial application than was at first deemed probable.

The second volume consists of 128 pages on the Spine, and the remainder on the Surgery of the Nerves. The portion on the Spine, it would seem, might as well have been omitted in view of the elaborate treatment of the matter in the author's *Étude de Chirurgie Médullaire,* the complementary work to the present one. We must remember, however, that the present work practically is an Operative Surgery and does not pretend to take up questions of differential diagnosis and treatment other than the operative. No critical judgment, therefore, as a rule, is expressed in the book excepting from the operative point of view. Those desiring to learn the author's views on spina bifida and laminectomy, etc., must seek them in his work on Spinal Surgery proper.

The operative processes are very thoroughly described. The method of reaching all the nerves of the body is described and illustrated. Naturally, the surgery of the fifth nerve has a very prominent place; in fact, 324 pages (considerably more than one-third of the entire second volume) are given to the various procedures to reach its branches or the Gasserian ganglion.

W. W. K.

A TEXT-BOOK OF PATHOLOGY, SYSTEMATIC AND PRACTICAL. By D. J. HAMILTON, M.B., F.R.C.S.E., F.R.S.E., Professor of Pathological Anatomy, Aberdeen. Two volumes, in 3 parts. 8vo., pp. xxii., 736; xxiv., 1139. London and New York: Macmillan & Co., 1889–1894.

PERHAPS there could be no apter commentary upon the wonderful progress of pathology during the past quarter century than a comparison of the large work before us with the small volume in which appeared Virchow's celebrated lectures upon cellular pathology, delivered during the spring of the year 1858. Then histology was in its inception. The cell had indeed long been known as the ultimate unit of living matter, but its paramount importance as the active, controlling element of all the tissues was only beginning to be appreciated, and the greater part of the 440 rather coarsely printed pages of the first edition of Virchow's lectures is devoted to a demonstration of the part played by the cell in the normal tissues and of its importance in the production of the lesions of disease. Now, no such argument is needed. What Virchow presented as a well-supported theory has come to be universally recognized law, and we have passed on to a solution of the mysteries of the influences lying behind the cell and inciting it to activity. Thus, a work which shall present the present status of pathology must include a discussion of the known facts regarding the causation of disease, it must relate all the discoveries of hundreds of workers in the vast field of pathological anatomy and histology, and it must contain for the clinician a rational explanation of the symptoms which he is daily studying at the bedside, so that he may be enabled to read through them back to the condition of which they are the outward manifestation. It is, then, no holiday task, the compiling of such a work, and it is not to be wondered at that about five years should have elapsed between the publication of the first and second volumes of Hamilton's *Text-book.*

As the work is not intended simply as a treatise on pathology, but as a working manual also, it opens with a detailed description of the autopsy, of the most approved instruments for its performance, and of the manner of its conduction. The various methods of preparing the tissues for microscopic examination are then detailed, the microscope is described, together with the uses of the various accessories, drawing and measuring apparatus, immersion lenses, etc. The way is thus prepared for the consideration of the causation of disease in general, and we are introduced to the methods of practical bacteriology as affording the means of investigating the problems concerned in it. The culture-media and the methods of their preparation, the special apparatus of the bacteriological laboratory, the making of cultures, the separation of species, the staining and study of the bacteria, animal inoculations, immunity, disinfection, etc., are all treated in detail.

Part II. is devoted to the general pathological processes, as they are called, and includes the discussion of the various infiltrations and degenerations of tissue, of inflammation, suppuration, healing and organization of tissues, ulceration, and dropsy.

Part III., devoted to the diseases of the various tissues and organs, makes up the bulk of the work, beginning at page 347 of Vol. I., and running through 953 pages of Vol. II. A description of the structure and reproduction of cells in general introduces the discussion of the various "new formations" and tumors, included among which are the so-called infectious granulomata—*i. e.*, tubercle, lupus, and gumma. One hundred and seven pages are allotted to the blood, after which the pathology of the various organs is discussed, beginning with the heart and bloodvessels and ending with the diseases of the skin. In this part, also, are chapters on the various malformations and on the diseases of the fœtal membranes and placenta.

Part IV. treats of the diseases due to vegetable and animal parasites, and in it the bacteria are studied systematically in their relation to the various diseases of which they are the cause. In this section are found also many of the discoveries of the past five years in general bacteriology, facts which would properly have been discussed in Part II. had they been known at the time of the publication of Vol. I. This is important, since the most material advances in pathology during the past few years have undoubtedly been in this very field, and by thus including them at the end of his second volume Hamilton has brought his book well down to date, and has in a very great degree bridged the gap between the publication of the first and second volumes.

The closing pages of the work (Part V.) are devoted to a discussion of animal heat and fever.

When it is added to this synopsis that the work is well and abundantly illustrated (623 figures, including a number of colored plates), that the numerous references in the text are supplemented by bibliographical lists at the end of every section, and that throughout the work the relationship of pathological anatomy and pathological physiology, of lesion and symptom, is sought to be elucidated to the fullest extent, it will not be doubted that we have here the most ambitious work upon pathology which has issued from the English press. A particularly commendable feature of the book is the author's effort to reduce all his explanations of pathological processes to conformity with physical and chemical law. We are too apt to overlook the fact that the laws of these sciences, which we recognize as governing all physical and chemical phenomena outside the body, apply also to similar processes within it, and oftentimes afford explanations of otherwise obscure conditions. The truth of this is apparent after the perusal of Hamilton's chapters on inflammation, exudation, œdema, and on the disorders of respiration, circulation, and nutrition. We must also mention the brief summary of the anatomical and physiological characteristics of each organ which precedes the discussion of its lesions, particular stress being laid in each instance upon those structures and functions most disordered by disease.

It would be surprising, indeed, if in so large a work there were nothing found to criticise. Pathology is now so extensive a subject that it is almost inconceivable that perfect unanimity of opinion upon all points should exist among its votaries, and it is with no desire to detract from the general commendation which Hamilton's work deserves that we call attention to two or three particulars in which we cannot entirely agree with him.

First and foremost, we must take exception to the classification of tubercle and gumma among the tumors. Even our German *confrères*, who have always inclined to regard the neoplastic elements of these processes as their most .important characteristics, stop short of this, making for them a special class to which they apply the name "infectious granulomata." But, even this appears to us illogical and inducive of great misconception of the real nature of the process underlying these conditions. Nothing could be more clear than their inflammatory nature, and we appreciate no reason for their dissociation from other inflammatory conditions induced by bacteria which it is the universal custom to discuss under the general heading of inflammation. Tubercle and gumma surely only differ from these in the degree of participation of the various structural elements which are always involved to a greater or less degree in all inflammations. Is not the wall of granulation and cicatricial tissue which forms about every retained necrotic or suppurative focus, separating it from the surrounding healthy tissue, as much a new growth as the connective tissue developed in connection with tuberculosis? And may we not as consistently consider the lesion of tuberculosis to have its distinctive structural characters because of distinctive peculiarities in the virus by which it is induced, as to suppose the excessive emigration so characteristic of suppurative inflammation to be due to the pronounced chemotactic quality of the micro-organisms of suppuration? The writer has, in fact, found it easy for students to conceive the idea of qualitative differences in the various inflammatory processes of bacterial origin being dependent upon qualitative differences in the various bacterial toxines where great difficulties have attended other conceptions of their production. In every inflammation the elements of the tissue participate, in a few degenerating only at the outset, in most showing sooner or later some tendency to proliferate. Now, when we remember that recent investigations into the nature of the tubercular virus have shown one of its ingredients to possess a remarkable power of stimulating connective-tissue cells to growth, and that in the slow course of the majority of tubercular processes abundant time is afforded for such connective-tissue development as occurs, those elements of the tubercular process which are usually cited as making it essentially different from other inflammations are explained. It would seem, therefore, to the writer that the separation of tubercular and syphilitic processes in a class by themselves is a distinct hindrance to the simplification of our conceptions of inflammation made possible by the developments of recent years in our knowledge of their etiology.

Again, we would take exception to the attribution of the power of spore-formation to the tubercle bacillus. It is true that many allusions to spore-formation by these bacteria are scattered through the voluminous literature upon them, but so far as we know no single element of proof of its occurrence has ever been produced, the only basis for such an assumption being a beaded appearance, often observed in the bacilli of tubercular sputum. But this may be much better explained upon the theory that such bacilli are dead and undergoing disintegration, both because of the irregularity of the beading and because of the presence of several lighter spots, the so-called spores, in each bacillus, while, so far as is known, in the definitely spore-forming bacteria only one spore develops in a single germ.

We must also express surprise that Hamilton should have selected Friedländer's pneumococcus as the cause of lobar pneumonia in preference to the Fränkel-Weichselbaum germ so constantly met with in that disease and now so universally acknowledged as by far its most frequent cause. And, finally, what is an "oat-seed-like spindle-cell sarcoma" (Cf. vol. i. p. 365)? Its source is not given, and, though we are loath to suggest it, the appearance of the cells as depicted in the figure is decidedly like that of some leiomyomata which we have seen, most of whose cells had been cut obliquely in the preparation of the section.

But, as has been said, the book is in general to be much commended, and affords many valuable suggestions to the teacher of pathology, while being at the same time a useful work of reference for the student and for the clinician. Its typography and general make-up have all the excellences of Macmillan's publications. J. S. E.

A CLINICAL MANUAL OF DISEASES OF THE EYE, INCLUDING A SKETCH OF ITS ANATOMY. By D. B. ST. JOHN ROOSA, M.D., LL.D. With one hundred and seventy-eight engravings and two chromo-lithographic plates. New York: William Wood & Co., 1894.

THE task of the fault-finder is not an enviable one; yet there are occasions when to find fault becomes a duty which one cannot conscientiously put aside. Having undertaken to review Dr. Roosa's recently issued *Manual of Diseases of the Eye*, we find ourselves, very unexpectedly, in the presence of such an occasion. To say of the book, without qualification, as a critic once said of phrenology, that what is new in it is not true, and what is true is not new, would be unwarrantable; yet we are forced to admit that an impression closely akin to this was uppermost in our mind when we closed the volume after a somewhat careful examination of its contents. In a word, where the author has followed the beaten track he has told us what we already knew, and told it in a less satisfactory manner than it has been told before; where, on the other hand, he has ventured upon bypaths of his own hewing—where he has advanced views that are peculiarly his own, he has proved himself to be an unsafe guide—the views proclaimed are, more often than not, radically unsound. Furthermore, the book gives evidence, from beginning to end, of want of accuracy and care upon the part of its author. This is shown in the unsystematic arrangement of the volume, in looseness of statement, in incorrectness in quotation, in carelessness in literary construction, and in the seeming absence of proofreading and revision. These are sweeping statements, which should not be made without abundant justification. Let us see if such justification exists.

On pages 263 and 275 we find these statements, which seem to us about equivalent to saying that most cases of smallpox have their origin in neglected eczema: "Much trachoma has occurred from neglected catarrhal conjunctivitis." "Trachoma is generally a chronic disease, the result of a conjunctivitis that has run its course. Investigation usually shows that there was at first an ordinary catarrhal conjunctivitis from which this sprang." Compare with this the clear-cut statement of Fuchs, in the recently issued English translation of his *Textbook of Ophthalmology* (p. 66): "Trachoma originates exclusively in infection proceeding from another eye affected with trachoma. Infection takes place by transfer of the secretion; contagion by means of the atmosphere, the existence of which was formerly accepted, seems not to occur."

On page 317, under the heading "Sympathetic Irritation of the Fellow-eye," we read: "This affection should be carefully distinguished from sympathetic *inflammation*;" but, on the following page, this statement occurs: "It is generally believed that it is the contraction of a cicatrix, or a new inflammatory process about a foreign body, which excites the sympathetic irritation. If we accept in full the microbic origin or septic origin of the disease, it is due solely to the transference of septic material from one eye to the other." The caution given on the preceding page seems to have been lost sight of; for, we believe, even the most ardent advocate of the theory that sympathetic *inflammation* is due to the migration of septic organisms from the exciting to the sympathizing eye has never claimed that sympathetic *irritation* originates in any such fashion.

On page 412 we find a repetition of this confounding of the two conditions by the author. In speaking of the different forms of incision which have been employed in cataract extraction, he describes that of Von Gräfe as encroaching too much upon the ciliary region. "This, he says, "was to invite sympathetic irritation, and so it proved. More eyes were lost from sympathetic irritation during the days when this operation was being performed than at any time before or since." And again on page 421 we read: "The wound made in the sclera by the bident [Dr. Agnew's] is a real objection to its use, because such an incision may possibly cause sympathetic irritation."

In the description of catarrhal conjunctivitis, on page 260, we find this: "It is a disease which sometimes is epidemic in communities. It is generally known as 'pink-eye' when this occurs. Spring catarrh is also a name used by the Germans to designate this epidemic form of catarrhal conjunctivitis." It is hardly necessary to say that the "spring catarrh" of German writers (which all must admit *is* an ill-selected name) bears about as much resemblance to catarrhal conjunctivitis as pterygium does to keratitis punctata.

On page 373 the unqualified statement is made: "Cataract is really an inflammation of the lens (phakitis)." And then follows, as though it were conclusive evidence in support of this assertion, this: "When mechanical injury has produced cataract, or, rather, is producing the disease, we may distinctly note the swelling that characterizes a true inflammatory process." Fuchs says, and we believe this view is entirely in accord with the teaching of modern pathology and with our present conception of what constitutes inflammation, that "inflammation of the lens—phakitis—does not exist. Inflammatory elements, such as round cells, occurring in the lens, do not originate in it, but enter the lens from the outside through an opening in the capsule."[1]

On page 535 we are told "presbyopia is a condition dependent upon the accommodative power, a *disease* [Italics our own] of the accommodation." On the following page, however, we find that, after all, the author probably does not regard presbyopia as a *disease*, for he says, "The *physiological* [Italics again our own] causes of presbyopia, in the light of our present knowledge, may be said to be of a threefold character." And then he proceeds to discuss the three causes. The first, to which he seems to attach much more importance than to the two others, and to which he devotes more than a page (seven lines being sufficient for the consideration of the second cause—loss of elasticity of the lens), is described as "a diminution in the contractile power of the ciliary muscle." "With the dawn of youth," he tells us, "its [the ciliary muscle's] power begins to decline, especially if over-exerted and if continuously employed. . . . . The aboriginal inhabitants of our country, the frontiersman, the scout, the sailor, the country gentleman leading an out-door life, usually have a greater accommodative power . . . . than the student . . . . the bookkeeper and the man of letters. To this there may seem to be exceptions, but usually they are only apparent ones, or they really prove the rule, that excessive use of the accommodation for near objects brings on presbyopia at an early age." To most of us, we venture to predict, all this is "news," indeed. The commonly accepted view of the nature of presbyopia is so well put by Fuchs, that we are constrained to quote him once more. "The diminution in the accommodation," he tells us (*op. cit.*, p. 622), "cannot be referred to the decrease in the power of the muscles in general, and the ciliary muscle in particular, occurring in old age, for it begins in youth, and probably even in childhood—that is, at the time when the muscles are still gaining in strength. In fact, the cause of the diminution of the accommodation lies in the gradual decrease of the elasticity of the lens."

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[1] Op. cit., p. 368.

The third cause of presbyopia Dr. Roosa describes as follows: "There is, perhaps, also an absolute flattening of the lens, on account of increased density (Stellwag) which shortens the axial diameter of the eye, [*sic*] and constitutes what Donders called acquired hypermetropia."

The beginner in ophthalmic practice, having been told on page 15 that "the nasal duct in its course passes downward, backward and outward," and that "this fact should be kept in mind when passing the lachrymal probe," will, we take it, be somewhat disconcerted when he reads upon page 206 that the probe should be "passed downward through the sac, and then downward, outward, and forward through the duct into the nose."

In this connection we would express our surprise at the author's statement, on page 248, that he occasionally finds it necessary to employ a "Number 20" lachrymal probe; for we have a distinct recollection that at the International Congress of Ophthalmology which met in Edinburgh last summer, when the subject of the employment of large lachrhymal probes was under discussion, he was most emphatic in condemning their use.

In the chapter devoted to "inflammatory affections of the conjunctiva" the author describes, besides catarrhal conjunctivitis and purulent conjunctivitis, an affection which he calls "blennorrhœa of the conjunctiva" (p. 262). We are unacquainted with such a disease as he portrays under this heading, and it seems evident that in describing it he simply had in mind severe cases of catarrhal, and mild cases of purulent, conjunctivitis. The name (blennorrhœa), it may be remarked, is a distinct misnomer when employed as a synonym for purulent ophthalmia (as the Germans use it), for its literal meaning is a flow of *mucus*.

Under the title "myotics," eserine, physostigmine, and pilocarpine are mentioned, and are said to be "used as local applications in solutions of one to four grains to the ounce" (p. 185). As to the first named, the statement would have been much nearer correct had it read from *one-eighth grain* to four grains to the ounce. On the same page, under the antiquated title "irritants," calomel, red and yellow oxides of mercury, and jequirity are described. The red and yellow oxides of mercury are said to be applied to the eye in the form of ointments, varying in strength from half a grain to two grains to the *ounce*. The red oxide, we believe, is but little used at the present time; the yellow oxide, for application to the eye, is commonly used in the strength of one grain to the *drachm*.

In the tabulation of the symptoms of acute glaucoma (pp. 355 and 356) no mention is made of the shallowing of the anterior chamber, of the enlargement of the pupil, or of the greenish pupillary reflex from which the disease derives its name.

The opinion expressed on page 384, and reiterated on page 400, that when a cataract is allowed to become over-ripe it is apt to induce choroiditis, atrophy of the iris, softening of the globe, etc., is one which, we believe, has the merit, at least, of novelty. The advice given on page 223, that, to induce anæsthesia in operations for cataract, an eight-grain solution of cocaine should be dropped freely on the cornea "every three to five minutes," for "from fifteen minutes to a half-hour before the operation," we regard as decidedly unsound. There is a consensus of opinion upon the part of experienced operators that such prolonged use of cocaine is not only unnecessary, but is actually harmful and should be avoided.

"The labors of renowned men," says the author in his preface, "have settled certain points forever; but there are still departments of ophthalmic science and art in which many things are under discussion, and concerning which widely differing views are held, especially in the United States. For my views on these subjects, which are chiefly to be found in the fourth part of this work, I invite an impartial hearing." The fourth part of the work, to which our attention is thus especially directed, is that in which errors of refraction and accommodation and affections of the ocular muscles are treated of. Here it is that the author, with a hardihood worthy of a better cause, ventures most frequently and most radically from the beaten track and indulges in bypath-hewing with the unhappy results alluded to at the beginning of our review.

Asthenopia he divides into "true or local, and the false or symptomatic." True asthenopia is that "which depends upon a refractive anomaly." The symptomatic or false asthenopia "depends on some error in the general nutrition, neurotic constitution, nervous exhaustion, or the like" (p. 448). *Muscular* asthenopia *has no existence.* He "formerly accepted the ordinary classification of an asthenopia dependent upon insufficiency of the external ocular muscles," but he has "come finally to reject it altogether" (p. 450). Even the term, he thinks, should be abolished, "as having no rightful place as generally used in ophthalmology" (p. 520). He no longer measures the relative power of the ocular muscles, and declares that we have "no occasion to look to insufficiencies as faults needing correction, except when they cause deformity or destroy binocular vision" (pp. 451, 452). "When I became familiar with the use of the ophthalmometer, in 1888," he tells us on page 520, "I once for all abandoned the idea of relieving muscular asthenopia except by correction of an error of refraction," and, he adds, "if the student will carefully correct the errors of refraction he will have no need for tenotomies except for strabismus, nor for prisms except for paresis or paralysis of the external muscles."

The only comment we will make upon such remarkable statements as these is to say that between one who holds such views and permits them to influence his practice, and one who cuts the ocular muscles for lateral insufficiencies without knowing anything of the refractive condition of the eyes, there is but little to choose. One is as much an extremist, is as distinctly eccentric, as the other.

Although we realize that our notice of Dr. Roosa's book has already reached an unreasonable length, there are a few other points in the part of the work under consideration which we think should not be passed over in silence. One of these is the statement made on page 453, that the best thing to do for the "large number of American asthenopes . . . who usually have from one to one and one-half diopters of corneal astigmatism, with from one to three or four diopters of hypermetropia, . . . is to make rather light of their troubles, and correct the astigmatism." If *three or four diopters* of hypermetropia, in an asthenopic individual, are to be "made light of," and disregarded in the adjustment of glasses, we should like to know at what point, in the opinion of the author, hypermetropia really becomes of consequence—not much short of aphakia, we should suppose. Of a piece with this is the opinion expressed on page 468, that the prescribing of convex glasses, for distant vision, in facultative hypermetropia is bad practice, and that it results in the relief of asthenopia only "in entirely exceptional cases."

We are not so much surprised, however, at these shortcomings upon the author's part in dealing with the correction of hypermetropic errors of refraction when we find, upon turning to page 465, that he actually does not know what the meaning of the term manifest hypermetropia is. "Manifest hypermetropia," he there tells us, "is that form in which the vision for the distance is improved by convex glasses." It is hardly necessary to say that this definition of manifest hypermetropia is absolutely incorrect. Distant vision of normal acuteness, without the aid of convex glasses, is not infrequently present, even in high degrees of manifest hypermetropia; indeed, in early life, this is the rule rather than the exception. We had marked for criticism a number of other passages in the chapters upon refractive and muscular anomalies, but want of space compels us to omit their consideration.

We have found fault with the literary style of the work; one or two examples must suffice to justify this criticism. On page 154 we are told: "The ophthalmometer, as invented by Helmholtz, was used by Donders and Knapp, in the first investigations of astigmatism since the days of Dr. Thomas Young." As Dr. Young died in 1829, when Donders was not quite eleven years of age, and Dr. Knapp was not yet born, this statement, it must be admitted, is a little mystifying. But hardly more so than this, on page 408: "It is true, that among Arabs and Persians and in the seventeenth and eighteenth centuries, cataracts were extracted by German and French surgeons." Or this, on page 421: "In one case Dr. Webster was obliged to remove the bident before he could remove the lens, although in some cases enucleation must be resorted to, in a dislocation of the lens, and in others the removal of the lens is only followed by severe inflammation which necessitates subsequent enucleation." The expression, "in quite a proportion of cases," occurs on page 128, and on page 307 we read: "The immobility of the iris is sometimes masked, so that we are not aware that it has suffered until a mydriatic is used, and we find it very sluggish." Of a different character are these (p. 546): "Although all deviations of the eye . . . *is* properly called strabismus;" (p. 535) "In advanced age, not only the near point but also the far point *recede;*" (p. 502) "It will be seen that not one of these who had no hypermetropia by the ophthalmoscope *were* without corneal astigmatism."

Two important quotations are made from Donders's *Acommodation and Refraction of the Eye*, one on page 508, the other on page 455. An error in punctuation in the former renders the quotation meaningless, while the latter not only contains a similar error, which destroys the sense of the last part of the quotation, but also a grammatical one ("ensues" for "ensue") which neither Donders nor his translator is responsible for.

Typographical errors present themselves with inexcusable frequency.

Among others, we have noted the following: on the title-page a "g" takes the place of the final "c" in "lithographic." In the index (p. x.), page "191" should be "119." In a quotation from Loring (p. 86), two errors occur, "bow" for "bowl" and "vein" for "rim." On page 247, "then the probe is *taken*," evidently should read "taken out." "In" takes the place of "is" on page 308; "correction" of "condition" (p. 404); "pen" of "pea" (p. 421); "preached" that of "reached" (p. 464). Other errors are "amblyopia" for "myopia" (p. 473); "occulist" for "oculist" (p. 523); "insufficiencx" for "insufficiency" (p. 525); "causes" for "cases" (p. 526); "unimpaired" for "unimproved" (p. 539); "or" for "for" (p. 541), etc.

Having indulged in so much unfavorable criticism of Dr. Roosa's book, we are glad to be able to say, before bringing our notice to a close, that there are some things in it which we can heartily indorse. Among these we may mention his condemnation of optico-ciliary neurotomy (p. 222); the advice given on page 247 to pass a probe through the canaliculus as a preparatory step to slitting it, in the treatment of stricture of the nasal duct; the opinion expressed on page 402, that local causes, such as the accommodative strain induced by astigmatism, are, not infrequently, important factors in the causation of cataract; and his commendation of the administration of sulphonal after cataract extractions, for the purpose of quieting the nervousness of the patient and insuring a better night's rest (p. 405). On page 549 there is reported a case of amblyopia developing in a squinting eye, which eye was known to have had normal vision previous to the occurrence of the squint. The case, which happened in the author's practice, is related because of its important bearing upon the question of the origin of the amblyopia of squinting eyes, and it is certainly one of great significance.

S. T.

MEDICAL JURISPRUDENCE, FORENSIC MEDICINE, AND TOXICOLOGY. By R. A. WITTHAUS, A.M., M.D., and TRACY C. BECKER, A.B., LL.B. Vol. I. New York: William Wood & Co, 1894.

IT must be confessed, in view of the admirable works of Devergie, Tardieu, Casper, Taylor, Christison, Woodman and Tidy, Wharton and Stillé, etc., accessible to every student, that the *raison d'être* for an elaborate work on medical jurisprudence, forensic medicine, and toxicology does not seem obvious. Apart from this consideration, it is particularly difficult, however kindly disposed the critic may be, to do justice to the merits of an extensive work such as the above, of which but one volume has appeared. The main objection to the present volume, as is usually the case in all such "systems" in any department of medicine, is that too much attention is given to relatively unimportant subjects and too little to important ones. Thus, for example, while 46 pages are devoted to the consideration of "The law of evidence concerning confidential communications," and 158 pages to the "Synopsis of the laws governing the practice of medicine" in the United States, Great Britain, etc., only 105 pages are given to death from suffocation, hanging, strangulation, and drowning, subjects which appear to us at least far more worthy of consideration than the laws governing confidential communications and the practice of medicine in Manitoba, Prince Edward's Island, and Ireland. On the other hand, the "powers and duties of coroners" have been so often discussed by practitioners that we welcome the excellent and authoritative article defining the functions of that ancient official. To those, however, who ever have held the position of coroner's physician it will certainly strike as extraordinary that in the article "Medico-legal autopsies" the subject of the identification of the deceased by two witnesses who personally knew the deceased during life is never mentioned.

This illustration, like many that might be given, gives the impression that the different articles in this work have been prepared by very learned jurists and physicians and surgeons of the highest standing, but not by men who have passed their lives in morgues and courts of justice.

This theoretical tendency is seen on the very first page of the introduction to the work, where the wordy and superfluous distinction between medical jurisprudence and forensic medicine is made, the former being defined as "medical law," the latter as the "application of medical, surgical, and obstetrical knowledge to the purposes of legal trials," Zacchias being referred to as the "father of medico-legal science," and as having recognized this distinction without a difference. Apart from Zacchias not being the first to write on medico-legal subjects, the fact that in the work *Pauli Zacchiæ Romani Quæstionum Medico-Legalium Francofurti ad Moenum*, MDCLXXXVIII, a page of advice is given to the *lectori medico* and another, with becoming modesty, to the *lectori legum perito* does not warrant the statement that Zacchias recognized any such difference as that made above. A lawyer may look at a trial from the legal standpoint, and the doctor from the medical one—the accused is, however, only tried once. In the article on "Identification of human bones," the statement that the skull of a fossil batrachian compressed into the rude resemblance to the human cranium will excite comment by those who are familiar with the writings of Scheuchzer and Cuvier. It is well known that the famous Oenigen fossil, described as "Homo deluvii testis et theoscopos" consisted of the remains of the skeleton of a batrachian, not simply of the head. In the otherwise excellent article on the "Medico legal determination of the time of death," it is to be regretted that in considering the subject of the loss of heat no mention is made of the classical observations of Goodhart, Niderkorn, Burman, etc., and in describing the phenomena of rigor mortis the work of Sommer should not be mentioned. It is true that the work of Sommer, *De Signis Mortem Hominis*, etc.: Hauniae, 1833, is a very rare one; nevertheless a copy of that book is to be found in Washington. In the article on "Wounds" we are surprised to see any positive statement as to the character of wounds made by "china, or glass, or fragments of bottles," as it is often impossible to say whether a wound was made by such fragments or by a cutting instrument. The article on "Gunshot-wounds" is an excellent one, as might be expected, emanating from such a high authority. That on the "Medical relations of electricity" is a most valuable and important contribution to the literature of that subject, the execution of criminals by electricity having given physicians the rare opportunity of observing the phenomena presented in death from that cause. The work generally, the contents of which we have endeavored to give some idea, is well printed, and many of the illustrations are most excellent. We regret to say, in conclusion, that however interesting this work may prove to the general reader, for the special student of medical jurisprudence it is not sufficiently full, the literature of the subject being but rarely referred to, while to the expert, medical or legal, actively engaged in the practice of their professions the work, even if never completed, is too voluminous. H. C. C.

DOSE-BOOK AND MANUAL OF PRESCRIPTION-WRITING. By E. Q. THORNTON, M.D., Ph.G., Demonstrator of Therapeutics in the Jefferson Medical College of Philadelphia; Acting Assistant Surgeon in the United States Marine Hospital Service. Pp. vii. 334. Philadelphia: W. B. Saunders, 1895.

THE book is an excellent presentation of a subject which is usually imperfectly taught in the schools if we may take as evidence the prescriptions found in the journals and reports of society proceedings. In the first part the weights and measures, both English and metric, and the methods of conversion from one to the other system are clearly set forth and well within the comprehension of the average medical student. Prescription-writing proper occupies the second part. We heartily indorse the arguments for the use of Latin, and believe that the grammar, vocabulary, and general directions will be found to be ample for the acquisition of correct phraseology. The subject of incompatibility is illustrated by excellent examples; antipyrin might have been added to the list of substances mentioned.

Finally, the table of solubilities will be of frequent use, especially to the younger practitioner. The third part takes up the official preparations and methods of prescribing. The preparations are classified as aceta, tincturæ, vina, etc., the doses given in both apothecary's and the metric systems, and illustrative prescriptions appended. The question of dosage and methods of administration receives attention in the fourth part, which closes with an extended list of official and officinal drugs and preparations, alphabetically arranged, and under each heading the substance is defined, its dose given, its preparations named, and occasionally remarks on its preparations or use.

In the appendix are to be found questions intended to test the knowledge of the student, and their answers. We have carefully examined this book and have found it to be singularly accurate, complete, and well adapted to the use of the student and junior practitioner. Of especial value we would note the insistence and example of the author in the avoidance of all abbreviations and the substantiation of his claim that this book is based upon the Pharmacopœia of 1890. R. W. W.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.A., M.D., LL.D.,

PROFESSOR OF CLINICAL MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; VISITING PHYSICIAN TO ST. MARK'S HOSPITAL.

Antitoxin and Nephritis.

Dr. Lennox Browne reports that a further experience in the use of this remedy has resulted in six deaths out of a total of eight cases treated, all due to inflammation of the kidneys. This is in confirmation of the testimony of Benda, who found, on the necropsy of thirty-nine subjects dying under the antitoxin treatment, nephritis in thirty-three cases; of these, eight were of a severe grade. From an analysis of one thousand consecutive cases of diphtheria, death, under the usual treatment, resulted from uræmia in only two and seven-tenths per cent., the total mortality being at the rate of twenty-seven and four-tenths per cent. It is clear that if we are to get at the truth of the results of the antitoxin treatment a necropsy should be made on every case dying under it, that we may learn the exact cause of death in each instance of fatal issue.—*Medical Press*, 1895, No. 2905, p. 51.

Diphtheria; Relapses after Treatment by Behring's Antitoxin.

Dr. Carl Goebel calls attention to the three hitherto-reported cases; one, that of Kossel, which died on the day of the relapse, four weeks after the first attack, of gangrenous diphtheria; the amount of serum which was used is not stated. The remaining cases received, each, one hundred and sixty immunizing units. To these the writer adds two cases. The first received fifteen hundred immunizing units. A boy, twenty-five months old, was attacked on October 22d, the membrane being found on both tonsils. Tracheotomy became necessary one-half hour after the injection, and the canula was retained until November 5th, when convalescence was established. On December 1st the diphtheric membrane again appeared on tonsils and hard and soft palate. On the 18th the condition was as before the relapse.

Evidently in this case a relapse occurred so late as forty days after the use of the antitoxin. In the second case, a girl of seven years became ill on August 30th. Recovery was established four days later. On September 30th a tonsillar diphtheria was found, which ended on October 5th. In this case a relapse occurred twenty-eight days after the primary attack, which was treated by the injection of one thousand immunizing units.—*Deutsche medicinische Wochenschrift*, 1895, No. 2, S. 29.

NUCLEIN.

DR. FRANK W. GARBER states that we have reason to believe that this substance possesses the power of stimulating the production of white blood-corpuscles, which are the natural defenders of the body, and that aside from this power they are also valuable as germicides. If the red blood-corpuscle is derived from the white, then nuclein will stimulate the growth of blood-corpuscles, and will be an almost direct enricher of the blood-supply. Clinical experience has certainly shown that nutrition is improved under the use of this treatment. It promises to be useful in nervous disorders which are not of organic origin, and in troublesome cases of digestive disturbances. It is possible that a large share of the good results alleged to have been obtained from the use of the so-called animal extracts may be properly attributed to the possible nuclein which they may contain. In the cases reported the drug was given once daily hypodermically, the dose varying from fifteen to forty-five minims; for the most part thirty minims were the maximum dose. The injections were made into the muscular tissues as near the site of the tuberculous lesion as could be, although this does not seem to be essential; they were often given in the arms; ordinary antiseptic precautions were observed. The needle should be frequently sharpened. Rubbing the part seems to cause a more speedy absorption of the solution and to lessen the period of pain, although the latter is never lengthy nor severe. The part, from frequent injections, becomes larger and more insensible; abscess has never resulted. Twelve cases were reported, the majority being of pulmonary tuberculosis, and these reports seem to warrant the belief that it is an agent of value in incipient tuberculosis, but that little can be expected of it in advanced cases. We are not in a position to say that it is positively curative. —*Therapeutic Gazette*, 1895, No. 1, p. 5.

THE TREATMENT OF ACUTE CORYZA.

DR. MARCEL LERMOYEZ proposes for the aborting of this disease, in the early stages, the inhalation of ten drops of the solution of pure carbolic acid, 5; ammonia, 5; alcohol, 10, and distilled water. Of the snuffs, that of menthol, 1; cocaine hydrochlorate, 2; salol, 20, and boric acid, 60, finely powdered, has the preference. Of the internal remedies, a mixture of equal parts of tincture of belladonna and tincture of fresh aconite root, of which thirty drops can be taken in two doses. A steam bath to produce energetic sweating sometimes has an immediate effect. Among the palliative measures may be mentioned spraying with warm solution of cocaine hydrochlorate, 1 per cent., to keep the nostril open. Or an unirritating antiseptic powder may be used, as cocaine hydrochlorate, 2; menthol, 1; bismuth salicylate, 20; milk-sugar, 20. If there is reason to fear cocaine-poisoning, a 5 per cent. solution of menthol in olive oil, sprayed into the nose, may be used. For relieving the facial neuralgias, and for the chilly sensations and malaise, at each meal may be taken quinine hydrochlorate, four grains, with antipyrine, eight grains. For the erythema of the nasal orifice, which is caused by the discharge, borated vaseline is useful. Hygienic measures, as sojourn in his room, and the avoiding of violent blowing of the nose, or sneezing, which may force septic mucus into the middle ear, should be observed. Douching the nose is absolutely forbidden during the acute stage, because it irritates the mucous membrane and endangers the ear. If later there is a chronic muco-purulent discharge, douches are indicated. Prophylactic measures consist in guarding against imprudence and in curing the chronic lesions of the nose.—*Journal des Praticiens*, 1895, No. 4, p. 51.

INJECTIONS OF ARTIFICIAL SERUM.

DR. GINGEOT makes use of 5 per cent. of sodium phosphate and 10 per cent. of sodium sulphate, in solution in distilled water, in neuropathic cases. He reports a single successfully treated case in which the diagnosis was onomatomania, agoraphobia, *folie du doute*, arithmomania, attacks with loss of consciousness, hysterical hæmianæsthesia, and cranial malformation. The results were not due to suggestion, since various other methods had completely failed. The amount used is from fifteen to fifty-two minims.—*Journal des Praticiens*, 1895, No. 2, p. 17.

THE TREATMENT OF PULMONARY TUBERCULOSIS.

DR. KARL VON RUCK recommends exercise, during the hours when the patient is free from fever, without reaching fatigue or shortness of breath. When the temperature rises above 100° F. he should go to bed in a well-ventilated room, and remain until it has subsided. On the following day he should anticipate the rise by going to bed one hour earlier. If the temperature is 101° F., an ice-bag should be applied over the heart until it is reduced to below 100° F. When there is pulmonary congestion, irritable cough, or pain in the chest, a cold, wet compress encircling the chest, covered with dry flannel, should be applied at bedtime and remain all night. A cold sponge-bath, followed by vigorous dry friction, must be given every morning, menstruation being no contra-indication. In the absence of fever his diet should be mixed and generous, and if he has not sufficient appetite, milk must be given freely between meals. Fever patients, as a rule, should receive only liquid food, with bread and butter added, while the temperature is elevated; the heartier meals must be given when fever is absent. If the weather is favorable, he should be out of doors; not, however, constantly upon his feet, or in a carriage, or on horseback, conditions which come within the limit of exercise, but quietly sitting or reclining upon a porch or place protected from the wind and dust, the latter being always injurious. Medicinal treatment should only be resorted to when the general management is not followed by satisfactory improvement or when complications arise. Excepting quinine, and preferably the salicylate, no drug antipyretics are permissible. Cod-liver oil should be given to patients who bear it well, even if we are obliged to limit or decrease the use of other fats. Creosote should be considered only as it may influence the bronchial catarrh or certain digestive derangements, it having no direct influence upon the disease. Diarrhœa not controllable by proper diet yields best to bismuth subgallate, eight to ten grains every three or four hours, or to similar doses of bismuth salicylate every six to eight hours; moist compresses to the abdomen over night are also beneficial. Cough, with expectoration, should not be interfered with; when due to congestion it yields to rest; when dry and harassing, apomorphine, one-sixteenth of a grain, with or without codeine, one-eighth of a grain, every two or four hours, gives the best results. Moist, soothing inhalations should be tried before resorting to opiates. Night-sweats yield less rapidly but more lastingly to cold sponge-baths at bedtime, and the use of the ice-bag over the heart, with which the patient goes to sleep. If the sweating is due to a weak action of the heart, strychnine, one-twentieth of a grain hypodermically, should be given upon retiring, or a dose of brandy or rum in milk may benefit. Atropine should not be used. Pleurisy, either acute or the circumscribed dry form, requires strapping for the relief of pain, rest in bed, counter-irritation, and, if effusion is present, the proper medical or surgical treatment for it. Bloody expectoration and hemorrhage are, as a rule, the result of physical over-exertion and otherwise improper conduct of the patient. Rest in bed, control of the cough by morphine, hamamelis, and the ice-bag over the heart have given the best results. In anæmia the preparations of iron have been disappointing; they are not well tolerated and tend to constipation. In some cases the blood-conditions improve under otherwise correct management and liberal diet, together with proper out-door life. In about twenty cases the Klebs tuberculin has given highly encouraging results, and in large doses has an apparently destructive effect upon the tubercle bacilli, with subsidence of the fever and rapid improvement of physical signs and general symptoms. There are not any disagreeable or undesirable after-effects. In a general way there is nothing more important than a good stomach, a good heart, and good common-sense on the part of the patient. They are the requisites for recovery.—*Transactions of the North Carolina Medical Society*, 1894, p. 30.

THE TREATMENT OF BRONCHO-PNEUMONIA.

DR. NOTHNAGEL states that the auxiliary muscles of respiration must be acted upon in order to avoid asphyxia, cyanosis, and carbon-dioxide-poisoning. For this purpose water-baths or Priessnitz's wet cloths are used. Under this treatment the patient is placed in a bath and a spray of cold water driven against the thorax, or the ordinary douche will serve the same purpose. To avoid venous stasis the position of the patient should be changed every hour by the nurse, and he should not be allowed to remain long upon his back. The nurse should also see that the patient makes four or five deep inspirations every half-hour. Drugs are administered for the purpose of removing the secretions by expectoration. Inhalations are useless, and ammonium chloride, sodium chloride, oleum terebinthinæ are no better. A few expectorants may suit special cases, as decoction of senega and ammonium chloride. To relieve cough we have at hand narcotics, such as belladonna, hyoscyamus, that greatly weaken, and are avoided at the present day. Codeine, in double the dose of morphine, has been much lauded as a remedy for cough. If the cough be severe, morphine with aqua laurocerasi may be given in small quantities; the latter alone does not afford relief. Morphine may be used with benefit in some so-called dry coughs—those produced by hyperæsthesia of the vagus branches in the lung. If a patient swallows all that comes up, or when he is too feeble, and in this case moist râles will be heard, or when the mucus is tenacious, we must not conclude that the cough is dry. For tenacious secretions the stimulating expectorants, as benzoic acid and senega, are indicated, or sodium chloride with warm water as an inhalation may give relief. —*The Medical Press*, 1895, No. 2905, p. 29.

KOLA.

DR. E. B. SMITH states that the great value of this drug is due to the alkaloids theobromine and caffeine, and to the principle known as kolanin. As an astringent kola has been used with marked success in cases of atonic diarrhœa, its combined astringent and tonic properties producing most satisfactory results. In the treatment of summer complaint of children it takes the place of opium, with none of its disadvantages. It aids digestion by increasing the activity of the salivary glands, augments the output of the digestive fluids, and is, therefore, beneficial in that form of dyspepsia which accompanies diarrhœa. Since it exerts a sustaining effect upon the vasomotor system, it becomes an important remedy in the treatment of children with diarrhœa when the circulation is enfeebled. When long-continued exertion is demanded, and little food is obtainable, it seems to possess sustaining properties similar to those of coca. It lessens tissue-waste, as is shown by the diminished excretion of urea. Upon the circulatory system it is a tonic stimulant; the pulse is increased in strength and frequency. It is also slightly diuretic. In alcoholism it may take the place of liquor; it builds up the nervous system, enabling the patient to withstand the craving for alcoholic stimulants. It aids in overcoming the indigestion, and is beneficial in relieving the vomiting. In phthisis it lessens the cough, and is of value. In pulmonary hemorrhage it is useful. Locally, it appears to be an astringent.—*The American Therapist*, 1895, No. 7, p. 176.

THE HYPNOTIC VALUE OF TRIONAL.

DR. G. A. HEWITT believes that the competition, struggles, anxieties, and responsibilities of commercial and professional life in populous communities constitute such a strain upon the nervous system in general, and the brain in particular, that insomnia, or a not very deep nor refreshing sleep, results. For this drug he claims that ten to twenty grains in warm fluids will produce sleep without producing toxic manifestations, depression of the action of the heart, or the force of the circulation. The sleep is sound and refreshing; the patient awakeus readily and with a clear head. There is little or no tendency to the formation of a habit, as no cumulative effect has been observed in some instances when the drug has been given without sufficient interval of time to allow for thorough elimination from the system. If administered for considerable periods of time and in large doses, it is a matter of prudence to watch the kidneys. It is useful in simple insomnia, in many chronic diseases unattended with severe pain, in mental affections of a mild character or in an early stage, and in the restlessness, excitement, and insomnia of insane patients.—*The Medical Bulletin*, 1895, No. 2, p. 41.

THE TREATMENT OF CHLOROTIC DYSPEPSIA.

DR. HENRI HUCHARD directs that milk shall be used, or, if this is badly borne, pure water or a hot weak infusion of tea (hot drinks excite the gastric secretion), eggs, *purée* of vegetables, lean fish, fowl, and cooked fruits. One-half hour before the meal a small dose of an alkali, as sodium bicarbonate, seven grains, should be prescribed, for the purpose of exciting the flow of gastric juice. At the same interval after it a Madeira glass of hydrochloric acid in solution in water, one to two hundred and fifty. The hydrochloric may be replaced by lactic acid, fifteen to thirty grains, after meals. It is necessary to forbid the use of wines, quinquinia wine, strong beers, alcoholic drinks, and stimulating food. If there are gaseous formations, lavage, either of pure water or water containing salicylic acid, one per mille, is indicated. After two to four weeks of this treatment the use of the preparations of iron can be begun, of which the proto-salts are preferable, oxalate, lactate, chloride, and iodide, in small doses, one and one-half grains, twice daily, and not to exceed six and one-half grains, daily, if we shall avoid symptoms of gastric intolerance.—*Journal des Praticiens*, 1895, No. 3, p. 33.

THE TREATMENT OF AN OBSTRUCTED BOWEL.

DR. W. THORNLEY STOKER has never seen the application of heat and rubefacients do substantial service. Of belladonna, if used freely and early in the disease, he holds a favorable opinion, and its best therapeutic effect is when uncombined with opium. Its chief use is in cases of peristaltic paralysis due to tympanites or fecal accumulation, but it must be given in full and repeated doses, and pressed until it shows its constitutional effects of either dilated pupil or dryness of the throat; it may be combined with calomel. Sodium sulphate is useful in hourly doses of one or two drachms, until an ounce or more has been taken. For washing out the bowel an ordinary red rubber tube, such as is used for lavage, presents the advantages that: 1, it can do no injury; 2, the fluid pressure can be regulated; 3, enormous quantities of water can be used; 4, the currents created by alternating pressure exert a solvent effect upon feces; 5, the operation can be carried on for a long time without exhausting the patient.

DR. JULIUS ALTHAUS believes that in the case of absolute mechanical occlusion, such as strangulation by bands, etc., the knife affords the only chance for the patient's recovery. Two cases are cited, in which the faradic current applied through an insulated metallic sound in the rectum and a moistened conductor to the abdominal parietes in the region of the sigmoid flexure, resulted in cure. Bondel and Laral have used the constant current as an electric injection, the rectum filled with salt water connected with the positive pole acting as an electrode; the negative pole is a large electrode upon the abdomen. The strength of the current is regulated by the susceptibility of the patient. The pseudo-strangulation and fecal obstruction relief has appeared in from five to twenty minutes. If a real obstacle is to be overcome, the current should be reversed after five or six minutes.—*British Medical Journal*, 1895, No. 1778, p. 186.

THE TREATMENT OF GALL-STONES.

DR. F. VON OEFELE, noting the difficulty in administering the quantity of olive oil which is prescribed for hepatic colic, proposes butter as a substitute. After the morning spring water at Neuenahr has been taken, fasting, and a quarter-hour exercise has been finished, seven to ten drachms of fresh, unsalted butter are taken with a little white bread. Then, after another quarter-hour of exercise, comes breakfast. The butter has a favorable influence upon the constipation, and if the stools are free from or deficient in biliary coloring-matters, they now become darker. The appetite was not affected, save in two instances, when it was unfavorably influenced. In cutaneous irritation this remedy in some cases is beneficial. For gall-stones this remedy is certainly curative, but even if it does not remove them, it is useful as a symptomatic remedy.—*Therapeutische Wochenschrift*, 1894, No. 2, S. 27.

THE MODERN TREATMENT OF TYPHOID FEVER.

DR. FREDERICK C. SHATTUCK considers that this disease involves two things which may make more or less contradictory therapeutic demands: (1) The duration and general character of the disease, which brings in its train the almost certainty of tedious convalescence and the dangers of death from exhaustion, and (2) the constant local lesion, the intestinal ulceration, the extent and depth of which we have not means of estimating or even inferring. In regard to diet, is it not possible that we sometimes make a mistake in dieting our patients with reference to their fever rather than with reference to their digestive capacity? They may have anything that is easy of digestion, and which leaves such residue as may reasonably be expected not to excite undue peristalsis and irritation of ulcerated Peyer's patches. Eggs (raw and soft-boiled), custards, animal broths, strained gruels, ice-cream, junket, blanc-mange, even scraped or very finely minced meat, in addition to milk, have been used during the past two years without cause for regret. The range of food should be as wide as the patient can digest, and such as is not likely to prove irritating to his ulcerated intestines. Water should be given freely internally to promote the elimination of soluble poisons. There is no evidence to show that the disease can be aborted by early purgatives—calomel, for instance—followed by more or less continued antiseptic treatment. The use of intestinal antiseptics should be limited to cases in which diarrhœa, very offensive movements, meteorism, or other special indications are present. Small doses of bismuth salicylate or subgallate are preferable; the former may be combined with beta-naphthol. In cases characterized by constipation water enemata every second day are ordered—glycerin enemata cause too much peristalsis. Among antipyretics phenacetin is the safest of those in common use. Observations in hospital show no marked or constant difference in the antipyretic value of cold sponging at 60° F. for twenty minutes, the cold-pack at 60° F. for fifteen minutes, or the full bath at 70° F. for ten to fifteen minutes. A full bath at 60° F. has a much more decided antipyretic effect. The use of alcoholic stimulants calls for the exercise of more or less judgment. In a considerable proportion of cases they are never required unless the tub-bath is used, reaction from the temporary depression, so often following this method of the application of cold water, being hastened by small quantities of spirits and water.—*Boston Medical and Surgical Journal*, 1894, vol. cxxxi. p. 604.

DR. P. LE GENDRE states that delirium at the commencement can be best treated by baths if there is no contraindication to their use. If the patient is more tolerant of warm baths, progressively cooled, these may be first tried. If he rebels against the duration of the bath, cold affusions to the head with successive lowering of the temperature may be employed. If this symptom appears in the second week, it is quite likely to be due to the elevated temperature, and reduction of this will relieve the delirium. If in spite of this, this symptom is accompanied by absolute insomnia, or there is a tendency to get out of bed, opium, chloral, or the bromides are indicated. If the condition of the heart is questionable, chloral must be used with care or even abandoned. If there is an intense albuminuria, scanty urine, or a tendency to constipation, these are reasons against the use of opium. The delirium of the third week is apt to be due to weakness, and calls for nourishing fluids, peptones in the bouillon, milk, alcohol, and generous wines. Headaches accompanied by gastro-hepatic symptoms are relieved by ipecacuanha. If associated with elevated temperature, compresses of vinegar, ether, or cherry-laurel water upon the forehead, or cold affusions to the head and neck during the bath, or, if there exist symptoms of cerebral congestion, a constant application of an ice-bag is indicated. Sometimes an ointment of potassium cyanide, 0.10 to 0.20 in cold cream, 20, upon the forehead and temples is useful. Insomnia in the first week is usual, and generally yields to bathing. If it is persistent in the second or third week, the cause should be ascertained—uncomfortable bed, lack of ventilation, too high temperature of the room, or bad odors. If this fails, opium, and especially associated with camphor, is useful. This may be associated with the bromides, or tincture of cannabis indica may be tried. Quinine in sufficient dose in the evening may be a hypnotic.—*Bulletin Général de la Thérapeutique*, 1894, 44e liv., p. 461.

A PLEA FOR VENESECTION.

DR. GEORGE C. LAWS thinks that the rule is universal that in all cases of inflammation so serious from degree or position as to involve danger to life, bleeding should be employed in the early stages, unless forbidden by general debility or the low grade of the fever.—*The Therapeutic Gazette*, 1894, No. 12, p. 806.

TREATMENT OF GONORRHŒA.

DR. PELLISSIER reports that, basing his observations upon the energetic action of citric acid upon the bacillus of diphtheria, and knowing that the gonococcus is best cultivated in an alkaline medium, he has used six injections daily of this remedy in simple water (1 to 100), cure resulting on the eighth day. As irrigations (8 to 1000), used once daily, this drug has cured in about eight days.—*Bulletin Général de la Thérapeutique*, 1894, 46 liv. p. 520.

MEDICINE.

UNDER THE CHARGE OF

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INDURATIVE MEDIASTINO-PERICARDITIS.

Harris (*Medical Chronicle*, November, December, 1894, and January, 1895) has collected all the cases of this interesting lesion (which was first carefully described by Kussmaul), and records three cases.

Post-mortem two varieties of the affection can be distinguished. One with adherent pericardium and marked increase of the fibrous tissue in the mediastinum. The exterior of the pericardium is closely adherent to the surrounding parts. This is the indurative mediastino-pericarditis. In the other variety there is an adherent pericardium with thickening of the sac, adhesion to the surrounding parts, but little or no general mediastinitis.

There are in addition rare instances, forming a third group, in which, without pericarditis, there is an increase in the fibrous tissues of the mediastinum—a chronic mediastinitis.

Of the twenty-two cases which he has collected, nine occurred in persons under eighteen years of age, only two in persons over thirty; seventeen cases were in males, and five in females. Usually there was a history of some acute illness, generally pericarditis. Some of the cases are tuberculous.

The symptoms indicative of the indurative mediastino-pericarditis develop at a late period. In many instances the onset is very insidious.

The symptoms have been chiefly dyspnœa, venous engorgement, cyanosis, cardiac enlargement, increase in the size of the liver, and general dropsy or ascites, with the pulsus paradoxus and inspiratory swelling of the vessels of the neck. In some cases the posture has been suggestive, as Jaccoud mentions: the patient sits up in bed with the trunk bent forward; but this, after all, is not an uncommon position in cases of pericarditis with effusion.

The duration of the cases varies. It is often difficult to say when the affection began. The period from the onset of symptoms which may be attributed to the affection to the fatal termination varies from a few months to several years. The cause of death is usually a gradual cardiac dilatation, or, in the tuberculous cases, an acute general infection.

The ascites which occurs in these cases, and which may be unaccompanied by general anasarca, is due sometimes to a peritonitis with chronic capsulitis and deformity of the liver.

A very interesting point in Harris's paper is a careful discussion of the pulsus paradoxus, in which the beats at the wrist become smaller during the act of inspiration. It is, of course, not a peculiarity of a mediastino-pericariditis, and is seen under many conditions. Kussmaul thought it was due to a dragging of the adhesions external to the pericardium on the aorta; but there are many observations of the occurrence of the paradoxical pulse where there were no bands of adhesion in the chest, so that it is evident that other agents are capable of producing it. Harris concludes that "cardiac weakness from many causes appears to have been a not infrequent condition present when a pulsus paradoxus was present, and it is quite probable that such heart-weakness, in some way which at present is not clear to us, contributes to, if it is not the actual cause of, this peculiar form of pulse in some of the cases of mediastino-pericarditis where the arrangement of the adhesions is not such as will account for a narrowing of the aorta or main arteries in the thorax."

Primary Cancer of the Duodenum.

Pic (*Revue de Médecine*, January, 1895), after a long and minute study ot primary cancer of the duodenum, draws the following conclusions:

I. Primary cancer of the duodenum, in the great majority of cases, like primary cancer of the intestine in general, has an annular form. On this account it is very apt to produce stenosis of the digestive tract.

II. The symptoms of this cancerous stenosis vary according to the height at which it is produced.

A cancer above the ampulla of Vater has a symptomatology almost identical with that of cancer of the pylorus.

A cancer below the ampulla presents, besides symptoms of malignant pyloric stenosis, signs indicating a permanent reflex of the bile and the pancreatic juice into the stomach.

A cancer round the ampulla presents, according to the case, a symptomatology more or less resembling the one or the other of the first two forms; it is a composite form.

III. Among the so-called cancers of the ampulla of Vater we may place:

1. Cancers of the duodenum in which the ampulla is invaded; nothing distinguishes these tumors clinically from ordinary duodenal cancers; they are included in our third form.

2. Cancers primary in the head of the pancreas.

3. There exist some cancers appearing to be developed at the expense of the ampulla, and presenting the clinical picture of icterus from retention—a picture comparable to that of cancer of the head of the pancreas. These cancers must be distinguished clinically and histologically from cancers of the duodenum strictly speaking, and must be classed with pancreatic cancer, of which they appear to constitute aberrant varieties (glandular or excretory).

4. *a*. In most of the cases there is a contraction at the site of the tumor and a dilatation toward the stomach, tending to involve this organ and frequently accompanied by pyloric insufficiency.

b. The histological examination has revealed up to the present, amongst the primary tumors of the duodenum, cancers of the investing epithelium type (cylindrical epithelioma), of the glandular type (primary epithelioma of Brunner's gland), of the embryonic-tissue type (sarcoma), and of the lymphatic type (lymphadenoma).

As a matter of fact, there are forms of cells entering into the constitution of the duodenum other than those found in these forms of cancer.

5. The difficulty of diagnosis in cancer of the duodenum varies according to the situation of the neoplasm; whilst the diagnosis of the form which occurs above the ampulla is ordinarily impossible, that of the two other forms is sometimes possible. Speaking in a general way, the chief differentiation is to be made between duodenal cancer and stenoses of the digestive tube of supra-duodenal (pyloric) or infra-duodenal origin; and between duodenal stenoses of extrinsic origin (from compression).

6. The topographical diagnosis is of greatest importance from an operative point of view, which will differ according to the situation of the neoplasm in the duodenum. When the diagnosis is impossible early exploratory laparotomy will be necessary, and in most cases will be only palliative.

PATHOGENESIS OF GASTRIC ULCER.

A good review of the recent theories of the pathogenesis of gastric ulcer is given by GRIEG (*Canadian Practitioner*, February, 1895).

According to this author, the exciting cause is essentially peptic in character, some predisposing condition of the gastric mucous membrane being necessary to allow of the digestion of the affected area; and it is these predisposing causes that Grieg discusses.

Trauma *per se* would seem insufficient to cause a chronic ulcer, but occurring in a poorly nourished, anæmic person, the author seems to think that ulcer might result.

Embolus, except in very rare cases, may be practically excluded, as no convincing case of ulceration following embolus is on record, and the ulcers produced experimentally by emboli are multiple and occur in the fundus, differing entirely from the solitary pyloric ulcers of the human being.

Thrombosis and various degenerative changes in the bloodvessels would seem to be the most likely predisposing causes, several cases having been reported in which the ulceration was associated with atheromatous and fatty changes in the arteries, or with endarteritis obliterans.

Hyperacidity, the author states, is a frequent, but not invariable, accompaniment of ulcer. Its presence, he thinks, is just as likely to be the result as the cause of the disease, though it would undoubtedly retard healing.

ULCERATION OF THE DUODENUM IN BRIGHT'S DISEASE.

In analyzing nearly eighteen thousand autopsies, with special reference to duodenal disease, PERRY and SHAW (*Guy's Hospital Reports* for 1893) found twelve in which duodenal ulcer coexisted with Bright's disease, and to these twelve cases added four from outside sources.

Among these sixteen cases one was at once distinguishable from the rest on account of the apparently indisputable relation between the nephritis and the ulcerative process. This case was that of a man, aged thirty-six years, admitted, after a two months' illness, for albuminuria and diarrhœa, blood having been present in the stools. The patient died after three days' residence in the hospital; the kidneys at autopsy showed marked cirrhotic changes, and the left ventricle was hypertrophied. Ulcerated areas such as are found in Bright's disease were present all through the large and small intestines, and the lower part of the duodenum was involved in the process.

The case seems to prove that the ulcerative entero-colitis of Bright's disease may rarely extend as high as the duodenum.

In the other cases the type of ulceration did not materially differ from that found when Bright's disease is not present. Of the twelve original cases the nephritis was seven times of the interstitial variety, four times of the tubal, and once of the two combined.

According to the authors, about 7 per cent. of persons die from nephritis, and as over 15 per cent. of their cases of duodenal ulcer show an associated nephritis, they conclude that a causal relation exists between the two.

Tuberculous Meningitis with Recovery.

The question of recovery in tuberculous meningitis has hitherto been obscured by doubt as to the diagnosis. This was not so in a case reported by Freyhan (*Deutsche medicinische Wochenschrift*, 1894, No. 36). Freyhan made a diagnostic puncture of the spinal canal in the lumbar region. About sixty cubic centimetres of slightly turbid, pale, serous fluid spurted out. In the sediment pus corpuscles and tubercle bacilli were found. The patient improved rapidly, and in three weeks after the puncture was able to leave the bed. Recovery can therefore not be looked on as a reliable sign in distinguishing between various forms of meningitis. Incidentally the case raises the question of the therapeutic value of puncture in meningitis.

Paralysis Consecutive to a Pseudo-membranous Angina Recognized as Non-diphtheritic by the Bacteriological Examination.

Under the above title Bourges (*Archives expérimentelle de Pathologie*, January, 1895) describes a case with the clinical picture of diphtheritic paralysis, but in the throat of which no Klebs-Löfller bacilli were found. The case occurred in a boy of seven years, in whom appeared suddenly high fever, headache, and pain in the throat. The next day the tonsils were gray and swollen, but no false membrane was present. Two days later the local signs had gone. Nine days from the first attack a second attack of malaise and fever occurred, with marked erythema on the neck, forearms, and limbs, but not on the trunk; the throat was normal, and the eruption disappeared two days later without desquamation.

A week from the beginning of this second attack the patient was taken with headache, fever, and sore-throat, and the next day a white, easily detachable false membrane was present over the tonsils; this remained until seventeen days later, when it had entirely gone, and the child was in fair health, though remaining pale and thin.

Sixteen days after the disappearance of the membrane the child became restless at night, and the next day complained of abdominal pain and headache; a little fever was present.

Two days later convergent strabismus developed, followed in forty-eight hours by nasal intonation of the voice and regurgitation of liquid food.

The regurgitation disappeared in a short time, but three days after its appearance the child was unable to stand, though still able to move its limbs in bed.

The paralysis remained incomplete, sensation normal, knee-jerks absent. Cure was complete at the end of two months.

The bacteriological examination of the false membrane showed the only virulent organism present to be the streptococcus pyogenes. The child's mother, who had been constantly nursing him, was attacked during his illness by a similar pseudo-membranous angina in which the sole pathogenic organism was the streptococcus pyogenes.

SEPTIC DIPHTHERIA AND SECONDARY INFECTION IN DIPHTHERIA.

It is often supposed that septic diphtheria, characterized by a severe local lesion and very severe general symptoms, is due to mixed infection with streptococci. GENERSISCH (*Jahrbuch für Kinderheilkunde*, Bd. xxxviii.) examined the internal organs and the blood of twenty-five cases of this kind, soon after death, in order to discover the actual conditions. He found that mixed infection did not necessarily accompany the clinical picture of septic diphtheria. Cases with the most pronounced septic symptoms were met with in which streptococci were not found in the internal organs; while, on the other hand, those organisms were found in cases without septic symptoms. The author, therefore, believes that the diphtheria bacilli alone are able to produce the so-called septic symptoms. The streptococcous infection he thinks can be discovered during life by examination of the blood.

REICHE (*Centralblatt für innere Med.*, 1895, No. 3) has examined the question of mixed infection in diphtheria in forty-two fatal cases treated in the Hamburg-Eppendorf Hospital. In all cases the diagnosis was established by the finding of Löffler's bacillus in the local lesion, and in all various other bacteria were found. These cases varied much in the extent of the local process and the number and severity of the complications. Twenty-seven required tracheotomy. In 64 3 per cent. of the cases both streptococci and staphylococci were found in the organs; in 45.2 per cent. streptococci only. Diphtheria bacilli were found twice. A very interesting fact was the finding of streptococci in the case of a child who died on the second day of the disease. In two other cases secondary infection was present by the third and fourth day. The possibility of the early occurrence of this important complication the author rightly looks on as an important limitation of the value of the antitoxic treatment as used at present.

DIGESTION-LEUCOCYTOSIS IN ULCER AND CANCER OF THE STOMACH.

SCHNEYER has reached some interesting conclusions in regard to the proportion of leucocytes during digestion in the gastric diseases mentioned

(*Internationale klin. Rundschau*, 1894, No. 39). In all of eighteen cases of carcinoma there was constant absence of the usual leucocytosis after meals. In three cases of benign stenosis and seven of simple ulcer the leucocytosis promptly appeared. A case of chronic ulcer with marasmus showed no leucocytosis. Schneyer explains the non-appearance of leucocytosis in cancer by disturbances of absorption, of peptonization, and of the lymphatic apparatus, the latter being rather hypothetical. The practical application of the observations is that the absence of digestion-leucocytosis does not positively indicate carcinoma, but that its appearance speaks against that disease.

VICARIOUS MENSTRUATION THROUGH THE LUNGS AND ITS RELATION TO TUBERCULOSIS, WITH REMARKS ON THE TREATMENT OF PULMONARY HEMORRHAGE.

KOBER (*Berliner klinische Wochenschrift*, 1895, No. 2) describes the case of a girl of nineteen years, with a tuberculous family history, who had severe hemorrhage from the lung at the menstrual period, without previous signs of pulmonary disease. The menses proper lasted only a few hours, but the pulmonary bleeding continued for three days with great severity. The bleeding then subsided, after nausea and vomiting had come on, and these latter symptoms lasted some days longer. During this time signs of pneumonia appeared in both bases, with mild general symptoms. In about ten days the patient seemed perfectly well. At the next period a similar set of phenomena appeared, but recovery was not complete. The patient was treated for tuberculosis, although bacilli could at no time be found. Efforts were made at the same time to bring on uterine hemorrhage at the next menstrual period, but in vain, and a third time pulmonary hemorrhage appeared, the amount of blood being less than at the former periods. Vomiting, fever, and a fresh pneumonic attack followed. The cough remained, diarrhœa appeared, loss of flesh and strength, with night-sweats and high temperature varied the picture, and in four months from the first hemorrhage the patient died. Tubercle bacilli could not be found up to the last.

Kober thinks the patient had tuberculosis at the time of the first hemorrhage, and that this was the cause of the vicarious menstruation, the lung forming a *locus minoris resistentiæ* which suffers in the high arterial tension of menstruation.

An interesting fact is that no remedy seemed to check the hemorrhage, but that each of the three attacks was cut short by nausea and vomiting. This recalls the treatment of Graves and Trousseau, the former using ipecac in nauseating, the latter in emetic doses. Kober proposes a combination, first causing vomiting, and then keeping up nausea by small doses of the remedy. The cause of the natural cure Kober does not explain, but suggests irritation of the vomiting-centre by lack of oxygen from loss of blood, or in a reflex way by the blood in the alveoli.

ACUTE RENAL DEGENERATION DUE TO CONVULSIONS.

REICHE reports some cases in which necrosis of the renal tubules seemed to be due to repeated convulsive attacks. For the interesting anatomical and clinical details the original must be consulted (*Centralblatt für innere Medicin*, 1895, No. 2). Reiche thinks the degeneration is due to intoxication by the products of muscle-fatigue. That these substances are poisonous is well known, and that the renal epithelium is extremely sensitive to such poisons is equally familiar. It is possible that the cases of albuminuria observed after marching or mountain-climbing, and those which occur after severe epileptic and other convulsive attacks, represent mild forms of a similar process. The author holds that delirium tremens and other forms of delirium, with restlessness and motor excitation, are possible causes of this form of renal degeneration. If this be so, the beneficial effect of hypnotics in delirium tremens, and of narcotics and other sedatives in uræmic and other convulsions, becomes clear, since by their help the organism is spared a dangerous complication. Animal experiments, and experiments with the toxicity of the urine and blood of patients with severe convulsions, may add much to our knowledge of this subject.

SURGERY.

UNDER THE CHARGE OF

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A CASE OF PROSTATIC HYPERTROPHY CURED BY CASTRATION.

LÜTKENS, of Cella, reports the following case in the *Deutsche medicinische Wochenschrift*, No. 5, 1895: A man, aged sixty-three years, sought advice on account of an obstruction in passing urine which necessitated the frequent use of the catheter. The patient had experienced trouble in urinating for several years, but he did not seek medical advice until the use of the catheter became difficult and attended with severe pain. Frequently clotted blood came out with the instrument. When the patient consulted Lütkens he could not pass urine spontaneously. On digital examination the prostate was found to be as large as a hen's egg, and projected into the rectum. The condition was so far advanced that the author decided that some radical measure was necessary. Castration and ligation of the internal iliac arteries were considered, and the former decided upon, because he had not seen the operation of ligation of the internal iliacs and he had no opportunity to practise it upon the cadaver; the technique is complicated and difficult, and besides, in gynecological practice, the results of castration for uterine myomata are better than follow ligation of the uterine arteries.

Double castration was performed on October 10th. Ten days after the operation there was a positive decrease in the size of the left half of the prostate; on November 6th (twenty-seven days) this half of the gland could not be felt, but the right lobe was still as large as a small walnut. On March 4th an examination proved that all signs of hypertrophy had disappeared. The following table shows the rapidity of the restoration of the normal function of urination:

		The patient passed in 24 hours	Drawn with catheter.
October 1–10	. . . .	. . .	2000–2500 c.cm.
" 10	Operation.		
" 11	. . . .	. . .	1900 "
" 12	. . . .	. . .	2100 "
" 13	. . . .	400 c.cm.	1750 "
" 14	. . . .	500 "	2000 "
" 15	. . . .	500 "	1650 "
" 16	. . . .	750 "	1500 "
" 17	. . . .	900 "	1500 "
" 18	. . . .	1000 "	900 "
" 19	. . . .	1150 "	900 "

After October 20th the catheter was no longer needed; the patient was urinating spontaneously and without trouble. On March 4th the patient was seen, and was entirely well. No living spermatozoa could be found in the testicles after removal. At the time this seemed an unfavorable sign, as Hegar advises against removal of the ovaries after the menopause. Lütkens believes that the atrophy of the prostate which follows castration is due to the change of nutrition caused by severing the vasomotor connection which normally exists between these glands.

GONORRHŒAL IMMUNITY.

JAMIN (*Ann. des mal. des org. Genito-urin*, November, 1894), in reviewing a recent work by GUIARD on gonorrhœa, comments favorably on the author's theory regarding inoculation and immunity, based on the following facts:

1. Gonorrhœa is a self-limited disease, recovery following after a varying length of time, without any treatment other than ptisanes, baths, and hygiene. 2. Abortive treatment does not succeed rapidly and fully until the period of acute inflammation has passed. 3. A patient, either male or female, apparently, though not really, cured is capable of transmitting a subacute gonorrhœa—that is, the colorless drop of secretion is capable of inoculation if it contains a few gonococci. The author consequently believes that the gonococcus during its evolution modifies its culture-media—*i. e.*, the urethral mucous membrane.

It continues to grow there but becomes more and more attenuated and latent, until it finally disappears. Unless this is true, a gonorrhœa untreated would last indefinitely, the cocci multiplying and reinoculating themselves in the infected urethra continuously. It is at the time when the virulence begins to diminish that abortive treatment succeeds. If, on the other hand, this attenuated gonococcus comes in contact with a healthy mucous membrane in another individual it is immediately rejuvenated, prospers, and produces acute gonorrhœal symptoms, since it finds there a suitable culture-media, which is not exhausted with that from whence it came and where it was about to die.

The objectors to this theory say: "If you admit that the *rôle* of the culture. media is thus superior to that of the microbe, how can you explain acute attacks in men having gleet? How can their exhausted mucous membrane become reinoculated?"

Guiard believes this reinfection is impossible in cases where the gleety discharge contains cocci. He, however, reserves his opinion regarding this form of relative immunity until further facts are procured.

THE RESULTS OF THE INJECTION OF LIVING AND DEAD BACTERIA INTO THE PELVIS OF THE KIDNEY.

SCHNITZLER and SAVOR (*Fortschritte der Med.*, December, 1894) conclude, from a long series of interesting experiments on dogs, that we should not speak of pyogenic and non-pyogenic bacteria, but that we are only justified in saying that certain bacteria have, under certain circumstances, the power to produce suppuration. In regard to the injection of dead bacteria, especially proteus, it is noteworthy that macroscopic suppuration in the nephritic tissues was not observed. When a round-celled infiltration was present still the running together and necrosis of tissues were absent. A quantitative and not qualitative difference could be made out.

The most marked result of their research is the fact that unwounded epithelium—*i. e.*, of the pelvis, of the kidney, and of the ureters—is no barrier against the working of dead micro-organisms; for their experiments show that dead bacteria injected into the pelvis of the kidney can produce a diffuse inflammatory change in the interstitial tissues of the entire kidney.

EARLY SYMPTOMS AND DIAGNOSIS OF TUBERCULOUS ARTHRITIS.

JUDSON (*Revue d'Ortho.*, November, 1894) says that we should never forget that "the pain of coxalgia is felt in the knee and that of Pott's disease in the stomach." In coxalgia this symptom is, however, subjective, and is not so valuable as the objective signs that are more marked. Amongst the first symptoms he places partial impotence in the limb, which disappears and reappears again later. It shows itself in the morning when the patient arises, and then disappears. The rhythm in walking is broken, the sound foot remaining longer down and coming down in a peculiar manner, as if to keep the weight off the diseased joint. The attitude in repose is also marked; the weight is sustained by the sound limb, the other being held in advance and to one side. To this is joined a muscular atrophy, with flattening of the buttock, with a marked shortening and shallowness of the gluteal fold. Measurement will also show a decrease in size of the entire limb. Reflex muscular obstruction of passive movements is a most marked early symptom, met most frequently, perhaps, in movements of rotation. Seat the patient on a table with the legs hanging down; make them swing with a lateral motion, and it will be noticed that the arc described by the diseased limb is less than the other. Now place the patient upon a hard bed or table and rotate the limbs inward and then outward. On the sound side the external and internal borders of the foot will touch, or nearly touch, the table, while on the suspected side rotation will be limited.

The limitation of adduction, abduction, and flexion can be studied by passive movements on both limbs. The patient may test this for you: ask him to kiss his knee—it is easy on the sound side, impossible on the other. These examinations should be made with care and gentleness, for our purpose is to study the slight differences in muscular reaction and to recognize the repugnance of the muscles to relaxation and the allowing of certain movements which their spasmodic action forbids.

As the disease advances these signs lose their importance, and are masked by three which, when present and recognized, make the diagnosis evident: 1. The enfeeblement of the patient is constant. 2. The atrophy of the muscles is very marked, due in part to the excessive activity of one limb and the rest of the other, inactive. 3. The total, or nearly total, absence of motion in the joint.

The Presence of Albumin in the Urine after Etherization.

The prevalent opinion that albumin is found in the urine after ether-narcosis, and that this is consequently an objection to its use, has been, to a certain extent, disproved by the researches of Barensfeld (*Münch. med. Woch.*, 1894, No. 41). He examined the urine of one hundred and fifty patients before and after either-narcosis and found albumin present in only four, and in three of these had no bearing on the ether-narcosis. In one, therefore, out of one hundred and fifty cases albumin was found in a small amount after ether, but disappeared after five days. The author says, therefore, that a true ether-nephritis does not exist, and agrees with Fueter and Roux in saying that albumin cannot be found after etherization where it could not have been found previously. He also relates a case of hydronephrosis in a three and one-half year old child in whose urine no albumin was found after etherization and nephrectomy.

Surgical Treatment of Carcinoma of the Stomach.

Klemm (*St. Peter. med. Woch.*, 1894, No. 49) summarizes his opinions on this subject as follows:

1. The therapeutic treatment of these tumors differs in no respect from that of cancer in any other portion of the body. It is purely surgical.
2. Operation is to be recommended, when possible, before the tumor is palpable.
3. Examination should only be made under deep narcosis.
4. Exploratory incision will in many cases give definite conclusions.
5. Those cases only should be recommended for resection of the pylorus where the tumor is freely movable and there is no metastatic involvement.
6. If these conditions are not present, the formation of a fistula between the stomach and jejunum is indicated.

7. This operation should not be delayed until the patient is nearly dead of hunger, and the knife then used as a last resource.

8. Under such circumstances a greater mortality is to be expected than from the simple operation.

AN ADDITION TO THE KNOWLEDGE OF TUMORS OF THE PENIS.

BUDAY (*Arch. für klin. Chir.*, 1894, Band 49, Heft 1) describes two cases of malignant growths of the penis, with the macroscopical and microscopical examination. The first case showed a cystic adenopapillary structure of undoubted malignancy, which was without doubt a true epithelial carcinoma arising from the inner layer of the prepuce. The second, however, differed both in clinical and anatomical characteristics from ordinary epithelioma, and was more like an elephantiasis of the penis. The thickening of the entire penis, with no involvement of pulmonary structures, made this seem probable, while the rapidity of the growth, paraphimosis, and the resultant swelling of the penis and formation of urinary fistulæ strengthened this probability. The hardness of the tumor and its sharp, deep outline, the formation of the fistulæ without inflammation, and the discharge of comedo-like material, and not pus, were, however, evidence against this diagnosis. The microscopic examination showed the tumor to be made up of a papillomatous epithelioma, the papilloma arising from an atypical development of tissue-hypertrophy. The origin of this tumor was probably from the mucous membrane of the fossa navicularis.

OTOLOGY.

UNDER THE CHARGE OF

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CONGENITAL FISTULA OF THE AURICLE.

DR. VAUTHIER observed a congenital fistula in the anterior superior portion of each auricle, giving exit to a slight, yellowish, somewhat malodorous liquid, in a female child born prematurely between the seventh and eighth month of gestation. The external ear was otherwise healthy. There were seven other instances of this peculiarity in the same family.—*Annales de la Policlinique de Paris*, vol. iii., No. 3.

TUBERCULOUS PERICHONDRITIS OF THE AURICLES.

HAUG, of Munich, has seen four cases of perichondritis in tuberculous patients in addition to external signs of disintegration of the affected parts, infiltration of lymphatic glands, and a tendency to ulceration. The diagnosis was confirmed by the microscope. Treatment by generous opening, excision of glands, and dressing with Peruvian balsam and iodoform. Prognosis is favorable, notwithstanding deformities of auricle.—*Langenbeck's Archiv*, vol. xliii.

REMOVAL OF AN EXOSTOSIS OF THE EXTERNAL AUDITORY CANAL.

HECKE has observed a patient, twenty years old, with exostosis occupying nearly all the external auditory canal. This developed during otitis media suppurativa, induced retention of pus in the drum-cavity, and brought about destruction of the tegmen tympani, exposing the dura mater. There was also a fistula in the mastoid apophysis. After detachment of the auricle the drum-cavity was exposed and the mastoid antrum was opened by following the fistula. Cure in six months by formation of epidermis in the vast cavity.—*Annales des Maladies de l'Oreille*, vol. xx.

EPITHELIOMA OF AURICLE.

DENCH regards epithelioma of the auricle as comparatively rare. He cites twelve cases of others, and reports a case where a hard tumor originated at the base of the tragus and extended slightly on the lower posterior border of the meatus. Ablation two months after first appearance was followed by complete cure. The prognosis seems more favorable here than anywhere else in the body.—*Archives of Otology*, vol. xxii.

BROMIDE OF ETHYL IN OTO-LARYNGOLOGY.

So far as concerns otology, **HELME** thinks, in children who resist all manipulations of their ears, this drug would do well. Under anæsthesia from it a polypus could be extracted, a foreign body removed, a Wilde's incision made, or a curetting of the cavum tympani performed (if it ever should be done.—REP.); also the Eustachian tube could be catheterized while patient is under the effects of bromide of ethyl. The author agrees with Hartmann and Bourbon, that for short operations nothing superior as an anæsthetic is known than bromide of ethyl.—*Annales des Maladies de l'Oreille*, vol. xx.

THE TREATMENT OF CHRONIC SUPPURATION OF THE MIDDLE EAR BY EXCISION OF THE AUDITORY OSSICLES.

DR. WILLIAM MILLIGAN, of Manchester, England (*British Medical Journal*, No. 1706), demonstrates the uselessness of all local treatment in many cases of chronic suppuration of the middle ear as long as necrotic ossicula and obstructing synechiæ remain in the drum-cavity; therefore, there is no hope of curing these cases until the necrotic ossicula are excised, the patient being under the influence of a general anæsthetic. Local treatment after this operation in the now better drained cavity is attended by good results. (Assuredly a mastoid opening for the purpose of better drainage and cure of chronic suppuration in the drum-cavity should not be thought of until excision of the diseased remnants of the membrana tympani and ossicula has been performed.—REP.)

ESSENTIAL NEURASTHENIA ASSOCIATED WITH SECONDARY AURAL AND RHINO-PHARYNGEAL MALADIES.

COZZOLINO endeavors to show that there is a clinical form of oto-neurasthenia connected exclusively with the labyrinth-expansions of the nerve, and can arise from the nerve-trunk. This form is often bilateral, and there is often a hyperacousma; it may be developed during cerebro spinal neurasthenia. When an individual with normal hearing complains of auditory disturbances, an examination of the cerebro-spinal axis and muscular systems should be made. Hallucinations of hearing are possible only in neurasthenics. These forms of neurasthenia accompany disturbances of sensibility and motility of the rhino-pharyngeal cavity.—Eleventh International Medical Congress, 1894. *Annales des Maladies de l'Oreille*, Tome xx.

INFLUENCE OF MALARIA ON DISEASES OF THE EAR.

GARZIA, Naples, believes that malaria may excite inflammations of the middle ear and spread thence to the labyrinth. These affections are curable by remedies for malaria and by local means.—Eleventh International Congress, 1894. *Annales des Maladies de l'Oreille*, Tome xx, No. 5, p. 511.

PROPAGATION OF AFFECTIONS OF THE TYMPANUM TO THE BRAIN BY THE WAY OF THE CAROTID CANAL.

KOERNER demonstrates anew the fact that the canaliculi conveying nutrient vessels from the carotid canal to the mucous membrane of the drum-cavity may become the passage-way of microbes of otorrhœa either with or without caries, and cause arteritis, lymphangitis, phlebitis of the venous plexuses, with participation of the lateral sinus, and even thrombosis of the carotid artery and consecutive cerebral embolism. He cites cases in which the external tunic of the artery was found infiltrated with tuberculous granulations, and admits the possibility of tuberculous meningitis having its origin in this way in bacillary otitis media.—*Archives of Otology*, vol. xxii.

TREATMENT OF CHOLESTEATOMA OF THE MIDDLE EAR.

REINHARD states that while authors do not agree upon the etiology and anatomy of cholesteatoma, they, however, are in accord as to its prognosis and treatment, viz.: that cholesteatoma of the ear is a dangerous and even fatal malady, and the treatment consists in the entire removal of epidermic masses. In light forms of the disease, without caries of the walls of the attic, the ossicles should be extracted through the external auditory canal; and in more severe forms, complicated with caries of the tympanic cavity, this ablation should take place by Stake's method. Of cases of extensive cholesteatoma it is necessary to make one cavity of the middle ear, the antrum, and the mastoid cells, maintaining as long as possible this opening, and endeavoring to make skin-graftings into it. Of nineteen cases, a permanent opening was thus maintained in fifteen cases. When such an opening did not exist the formation of cholesteatomatous masses and suppuration continued.

Politzer, in the discussion of this communication, called attention to the fact that such a proceeding favored the propagation of epidermis in the drum-cavity, which propagation, as is well known, might be regarded as a cause of cholesteatoma.

Dundas Grant stated, at the same time, that it is of the first importance to prevent moisture after this operation, and to have recourse to the insufflation of antiseptic powders.—Eleventh International Medical Congress, Rome, April, 1894. *Annales des Maladies de l'Oreille,* Tome xx.

SURGICAL INTERVENTION IN SEPTICO-PYÆMIA CONSECUTIVE TO OTITIS MEDIA SUPPURATIVA.

H. **NIMIER** contributes a good paper on general surgical treatment of sinus-thrombosis and resultant pyæmia. How many such cases would never occur if the ear had not been neglected originally! Had the patient been sent promptly to an aurist, who alone is capable of treating the acute disease, the necessity to call in the general surgeon would never have arisen.—*Annales des Maladies de l'Oreille,* Tome xx.

PERCUSSION OF THE MASTOID PROCESS IN A CASE OF PYÆMIA CONSECUTIVE TO AN ACUTE AFFECTION OF THAT PROCESS.

WILD advocates the percussion of the mastoid with a metallic hammer as a means of early diagnosis of caries of the temporal bone. Recently he observed a case of otitis media suppurativa in which the dull percussion sign was the only local symptom of osseous disease, which furthermore was complicated by the usual symptoms of pyæmia. Opening of the mastoid was followed by quick improvement and soon entire cure.

Moos thinks percussion of the mastoid has only a positive value. When dulness on percussion is absent we may not conclude there is no affection of the bone.—*Annales des Maladies de l'Oreille,* Tome xx.

USE OF THE CURETTE IN MASTOID OPERATIONS.

C. J. **BLAKE**, after opening the antrum by a trephine or enlarging an opening already present, uses curettes of various sizes for removing diseased tissues. He employs no sutures, but applies a dry dressing. The operation is preceded by a large incision in the membrana tympani.—Eleventh International Medical Congress, 1894. *Annales des Maladies de l'Oreille,* Tome xx., No. 5, p. 511.

ASSOCIATION OF HYSTERIA WITH LESIONS OF THE EAR.

GRADENIGO maintains that hysteria of the ear is frequent. In a hysterical subject a slight affection of the ear, either inflammatory or traumatic, causes local and general nervous phenomena disproportioned to the lesion. Most cases of otalgia in young women, when dental caries, sore-throat, and syphilis can be excluded, are due to hysteria. He cites cases of periodical hemorrhages from the ear and of hysterogenous zones of the ear. Also he states that hysterical subjects simulate deafness.—*Annales des Maladies de l'Oreille,* Tome xx., No. 5.

PATHOGENY OF OTITIS INTERNA.

GRADENIGO asserts that there are two forms of otitis interna: one due to the propagation of an otitis media catarrhalis, and the other to a primary disease in the internal ear, as syphilis, acquired or hereditary, parotitis, and influenza. But even in these cases there exist previously slight lesions in the middle ear, which explain the localization of the disease in the internal ear, and its gravity. Also catarrh of the nasopharynx will be found in addition to these lesions in the middle ear. Hereditary predisposition also plays an important part, so that this, with some old lesion in the ear, plus the acute or chronic infection, like influenza, diphtheria, acquired or inherited syphilis and tuberculosis, determines the occurrence of an otitis interna. The part played by syphilis is especially important, and a number of cases of supposed sclerosis are really lesions of attenuated and delayed hereditary syphilis.—*Annales des Maladies de l'Oreille*, Tome xx., No. 5.

LESIONS IN THE LABYRINTH IN A CASE OF LEUKÆMIC DEAFNESS.

WAGENHÄUSER gives an account of a woman, thirty-five years old, attacked with leukæmia in April, and six months later with total deafness, at the time of a profound infiltration in the right arm and thigh, apparently due to interstitial hemorrhages. No data as to vertigo or tinnitus. Sudden death eight months later.

Post-mortem examination revealed normal tympana; but in the internal ears, cochlea, vestibule, and semicircular canals, extensive and copious extravasation, with numerous round cells; these lesions most marked in the semicircular canals. The primary lesion in this case had been hemorrhage into both labyrinths, productive finally in the contiguous area of an inflammatory process resulting in new formations of connective tissue and bone.—*Annales des Maladies de l'Oreille*, Tome xx., No. 5.

DEAFNESS CONSECUTIVE TO CEREBRO-SPINAL MENINGITIS.

This is represented by 4 per cent. of all cases of so-called nervous deafness. When this deafness persists after the early days of convalescence the prognosis is unfavorable. There is a form which disappears spontaneously as soon as convalescence sets in. These spontaneous cures may be due to the treatment, viz.: to the action of pilocarpin.—*Annales des Maladies de l'Oreille*, Tome xx.

KINDERGARTENS FOR DEAF-MUTES.

FLATAN (Berlin) has founded a kindergarten with the view of developing physically deaf-mutes under the age of eight years. No instruction is given in speech. Search might be made among the pupils for those still retaining some hearing, and, if such is found, hearing could be cultivated by proper exercises. Flatan thinks that such schools, supervised by a physician at once a hygienist and aurist, could in the future furnish valuable material for the scientific study of deaf-dumbness.

Politzer, in the discussion, stated that sometimes the improvement in hearing following exercises of this function should be attributed to the perfecting of the tactile sensibility of the skin of the auricle, in consequence of which deaf-mutes are able to distinguish the different vowels pronounced near them.—Eleventh International Medical Congress, 1894. *Annales des Maladies de l'Oreille,*, Tome xx., No. 5.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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The Laryngological Society of London.

We would like to call attention to the excellent work being done by the Laryngological Society of London, and would advise all special workers in laryngology and cognate branches to secure copies of its Proceedings, which are published at short intervals. The brief discussions on cases presented to the Society often afford invaluable instruction in differential diagnosis elsewhere unattainable, while the general worth of the subject-matter is not exceeded in the transactions of any other organization.

Morbid Growths in the Nasal Passages.

An instance of pedunculated papilloma of the septum narium of the left side, in conjunction with a rodent ulcer on the right side of the nose, was shown by Mr. P. de Santi to the Laryngological Society of London, November 14, 1894 (*Proceedings of the Lar. Soc. of London*). The patient was a man, eighty-two years of age. The tumor was apparently of some five years' development. The rodent ulcer, the size of a Spanish nut, was of little more than one year's duration.

Technique for Extirpation of Malignant Disease by Thyrotomy.

In the concluding portion (*The Lancet*, 1894, No. 3722) of an article by Dr. Felix Semon, on "The Results of Radical Operation for Malignant Disease of the Larynx" from the experiences of private practice, the improved technique is described under which satisfactory results are to be anticipated by the method of splitting the larynx in front and then removing the soft parts, and likewise, if necessary, resecting some portions of the cartilages.

The first step is tracheotomy and the introduction of Hahn's aseptic compressed sponge-canula into the trachea. The larynx is then exposed, but is not opened until the canula has been in position at least ten minutes, in order to give the sponge full time to expand and occlude the trachea hermetically. After the larynx has been divided, its two halves are carefully held asunder with retractors or with two strands of strong silk passed through the anterior portions of the wings, and a comparatively large aseptic sponge secured by a long string is introduced through the larynx into the lower part of the pharynx, so as to protect the field of operation from mucus and saliva.

The whole of the side of the larynx to be operated upon is then mopped twice with a 5 per centum solution of cocaine, to contract the capillaries on that side and restrain parenchymatous bleeding. Arrangements should have been made for thorough illumination by aid of the frontal mirror or of an electric lamp.

The parts to be removed are then circumscribed as far as possible between two semicircular or elliptic cuts uniting in front and behind through the whole of the soft tissues and down to the perichondrium, and at a distance of from half an inch to an inch from the periphery of the growth, so as to insure section in the healthy tissues. The growth is then to be held in dressing-forceps, and the whole area circumscribed is to be cut out with curved scissors, the points of which are to be firmly pressed against the inner aspect of the cartilage. The base should be firmly scraped with a sharp spoon, the bleeding be carefully stopped, even by ligating small vessels if requisite, and the whole interior of the wound be dusted with iodoform or with iodoform and boric acid mixed in equal parts, and the sponge canula be immediately removed. The whole of the wound is then covered with cyanide gauze.

MORBID GROWTHS OF THE LARYNX—DIFFUSE SUBGLOTTIC MYXOMA RADICALLY REMOVED BY DIRECT ACCESS THROUGH AN INCISION INTO THE TRACHEA.

This case is reported by DR. CHARLES H. KNIGHT, of New York (*New York Medical Journal*, 1894, No. 835). The patient was a woman, forty-eight years of age. The growth was found to involve the entire circumference of the windpipe, from the under surface of the vocal bands to a point one-half to three-quarters of an inch below the lower limit of the tracheal incision. This incision was two and a half inches in length, made over the upper rings of the trachea. The operation was easy and the results excellent. A photomicrographic illustration of a section of the growth accompanies the report.

The case is unique in the character and location of the growth and in the operation performed for its extirpation.

FRACTURE OF THE LARYNX.

In *The Medical News* (1895, No. 1154) DR. THOMAS J. HARRIS, of New York, contributes an article on "Fracture of the Larynx," with the report of a case. A summary of the subject is given, with the details of twenty-nine cases reported since Durham's record of sixty-two cases in 1881.

Dr. Harris's case occurred in a member of the United States Band at West Point, who, sometime previous to the accident, had been compelled to play eleven different musical instruments. While playing the baritone, three years before, he had suddenly felt a pain in the right side of the neck, which was accompanied by great swelling, extending to the right ear; loss of voice, dysphagia, and dyspnœa. Subsequently there was occasional discharge from both ears, with great deafness. Persistent headache set in two months later, and had been distressing. Cough had been persistent. Swelling continued for over a year, and subsided gradually.

The fingers pushed under the right ala at its upper border could detect a distinct crepitus when the patient swallowed, while he stated that he felt a marked rubbing of the two bones in the act. Pain was also produced when the cornu of the hyoid bone on the right side was grasped. Examination of the larynx with the mirror revealed nothing beyond signs of a chronic inflammation, although the false bands have always been rather acutely swollen.

Although repeated examinations of the patient have been made, Dr. Harris has never been certain how extensive was the injury. He thought the most probable condition was one of fracture of the superior cornu of the thyroid on the right side, with loss of function of the right lateral thyrohyoid ligament. Whether there was any associated injury of the cornu of the hyoid was scarcely possible to determine definitely.

ELECTROLYSIS IN SPURS AND DEFLECTIONS OF THE SEPTUM NARIUM.

DR. KARL HESS (*Münchener med. Wochenschrift*, 1894, No. 39), in an article on this subject, expresses his preferences for the bipolar method with platinoiridium needles, kept in action from three to five minutes during the earlier sittings, and six to ten minutes in the later ones; the current being increased gradually and then gradually decreased during the sitting. Eight to ten days intervene between the sittings, and four to six are necessary, so that the treatment requires five to seven weeks.

OBSTETRICS.

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RUPTURE OF THE UTERUS IN LABOR OBSTRUCTED BY DISLOCATED KIDNEY.

A rare and interesting case of rupture of the uterus is reported by ALBERS SCHÖNBERG (*Centralblatt für Gynäkologie*, 1894, No. 48). The patient had already borne two children, both in difficult labors, the first child being stillborn. During her third labor, pain suddenly ceased, with symptoms of collapse and vomiting. A dead child was delivered by version and extraction, the placenta removed, the rupture in the anterior wall of the uterus recognized, and the patient immediately transferred to a hospital. As there was no bleeding, and the uterus was well contracted, the abdomen was not immediately opened. On the fifth day after admission, and upon symptoms of intestinal occlusion, cœliotomy was performed. The bowel was found paralytic, but no other abnormality was discovered. The patient survived but a few hours.

On post-mortem examination the left kidney was found in the hollow of the sacrum, its upper extremity in front of the promontory. The renal artery took its origin from the bifurcation of the aorta, and the renal vein emptied into the vena cava. The hilus of the kidney was directed toward the right. It was possible for a child to present by the head normally and for the kidney to offer but little obstruction to its birth. When, however, the child presented in the second position, the kidney afforded an obstacle 2 cms. thick to the passage of the child. The pelvis was a simple flat pelvis, with a true conjugate of 9½ cms. It was remarkable that so little bleeding and such slight shock followed the rupture of the uterus.

INDICATIONS FOR THE INDUCTION OF LABOR.

In a discussion upon this topic before the British Medical Association **BARNES** drew attention, among other causes, to excessive nervous tension as indicating a pathological condition requiring interference. Chorea and epilepsy are extreme types of this disorder, as are mania and marked emotional disorders. Excessive vomiting, especially in the latter months of gestation, is also considered an indication.—*British Medical Journal*, 1894, No. 1773.

SYMPHYSIOTOMY FOR SYMMETRICALLY CONTRACTED PELVIS.

ENGSTROEM, of Helsingfors, reports in the *Annales de Gynécologie*, December, 1894, a symphysiotomy in a patient, aged thirty-one years, who had lost her first child after a difficult labor in breech presentation. Her pelvis was symmetrically contracted, the true conjugate being a little less than 8 cms. The patient was allowed to go to term, when a living child, whose head measured 9 cms. in the biparietal diameter, was delivered after symphysiotomy. The mother was convalescent and able to walk in three weeks after the operation. The usual incision was practised, the wound entirely closed and hermetically sealed, and the patient's pelvis tightly bandaged with a binder and rubber adhesive straps. The head of the child showed a slight depression where labor-pains had driven it against the promontory of the sacrum.

WHEELER (*Boston Medical and Surgical Journal*, 1894, vol. cxxxi., No. 26), performed symphysiotomy upon a multipara who had had difficult labors; in each instance in which the child had been of average size it had been stillborn. The endeavor was made to bring the head to engage by pressure and by the use of the Tarnier forceps for fifteen minutes. Symphysiotomy was then performed in the usual manner with the Galbiati knife. The child was delivered with forceps, the cord being tightly drawn about the neck. It was cut, and the child resuscitated. During the passage of the head the symphysis separated two and a quarter inches. The true conjugate of the pelvis was 8 cms.; the biparietal diameter of the child's head was $9\frac{8}{10}$ cms. The pelvis was immobilized with adhesive plaster, and the wound closed without drainage. During the puerperium the patient suffered slight phlebitis in the left leg, which is ascribed by the writer to keeping her lying too long upon her back, namely, three weeks. At the end of the fourth week, by examining the patient while standing and swaying from one foot to the other, motion of perhaps a third of an inch was felt in the symphysis.

PUERPERAL NEURITIS.

In the *Deutsche med. Wochenschr.*, 1894, No. 50, BERNHARDT reports three cases of puerperal neuritis; in one, the median and ulnar nerves of the right side were affected; in the second, the left perineal nerve; and in the third, the right median and ulnar nerve. In the second case the forceps was applied, the head of the child remaining high in the pelvis in the second position before the use of the instrument. In the third case, the patient was ill for four months after labor, suffering with a bloody discharge and fever. All the cases presented the typical signs of neuritis, and were but little affected by treatment.

RUPTURE OF THE UTERUS DURING VERSION.

In the *St. Petersburger med. Wochsenchr.*, 1894, No. 47, ARMIN TREU reports the case of a multigravida whose child died within the womb, and in whom labor ceased by reason of absorption of putrid material from the child. On examination, the lower portion of the uterus was found bound down by an old and firm adhesion extending across the posterior surface of the lower uterine segment. In performing version, the lower uterine segment ruptured just above this adhesion, the rupture being complete. The fœtus and placenta were, however, removed manually, and the patient made a complete recovery.

TREATMENT OF BROW AND FACE PRESENTATIONS BY MANUAL INTERFERENCE.

In the *Zeitschrift für Geburtshülfe und Gynäkologie*, 1894, Band xxxi, Heft 1, THORN contributes a paper on the "Treatment of Brow and Face Presentations by Manual Interference." He reviews the literature of the subject, and, from his own experience and that of others, believes that when a face presentation develops at the end of the first or second period of labor, that delay is dangerous in the interests of the child. The first effort of the obstetrician should be to change the presentation into an occipital one by combined manipulation under anæsthesia. For the success of this manœuvre, it is requisite that the fœtus be movable in the pelvis, and that the mouth of the womb be sufficiently open to permit the introduction of at least half a hand. The combined method is contra-indicated when the face presentation was present from the beginning and did not develop through abnormality in the mechanism of labor; also contra-indicated in prolapse of the umbilical cord or of the fœtal extremities in placenta prævia and low attachment of the placenta, where the lower uterine segment is greatly distended, and where disproportion between the fœtus and pelvis exists.

In cases where the pelvis is normal, if the combined manipulation fails, and there is no immediate danger to the child, it is best to wait to observe whether the attempt to alter the presentation may not result in increased labor-pains and further progress in the labor; when, however, this improvement does not occur, internal version should be performed. Where the pelvis is contracted version and extraction by the feet should follow.

In brow presentations, when the brow is found above the brim of the pelvis, and movable in the pelvic inlet, the pelvis being normal, the attempt should be made to convert the presentation into one of the vertex by manipulation. When this fails, unless labor proceeds spontaneously, internal version must be performed. If brow presentation occurs as a complication of contracted pelvis, even in slight degree, delay should not take place, but failure in combined manipulation should lead to a prompt resort to version.

THE TREATMENT OF COMPLETE RUPTURE OF THE UTERUS.

CHOLMOGOROFF (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xxxi., Heft 1) reports the following interesting case. The patient was a multipara who had borne four children by difficult labor, the last of which was terminated by craniotomy, with laceration of the anterior wall of the neck of the uterus. The patient recovered completely in three weeks. Examination of her pelvis showed a justo-minor pelvis of moderate contraction. The fifth pregnancy went on normally. When labor commenced, hemorrhage of moderate degree ensued. The patient was under the care of a midwife, who ruptured the membranes. The labor, however, failed to proceed, and the patient was brought into the hospital. On admission, examination showed the fœtus with its long axis parallel with that of the uterus. The head could be felt above the usual position. No heart-sounds were present. On vaginal examination the mouth of the uterus was found fully dilated. In front and to the right could be felt a considerable portion of the placenta. The breech of the child was at the pelvic inlet, the sacrum directed posteriorly and to the left. The right foot was found on the same level with the breech. Hemorrhage, although not excessive, persisted. Accordingly, the right foot of the fœtus was grasped; following this, the hemorrhage did not abate, and accordingly extraction was immediately carried out. As the breech was an inefficient tampon, the hemorrhage continued. The extraction of the child was a most difficult one, and recourse was finally had to craniotomy upon the after-coming head, the opening of the skull being made through the palate. After the extraction of the child, hemorrhage did not entirely cease, and an examination showed the transverse rupture of the uterus at the cervix. The placenta lay in the abdominal cavity among the intestine. The fœtus also had been in the abdominal cavity. After the removal of the fœtus and placenta the hemorrhage did not cease. The condition called for a choice between two methods of treatment, one by cœliotomy, the other by the use of the tampon. As the fœtus had been in the abdominal cavity for some little time, and the entire labor had not been conducted antiseptically, infection of the peritoneum was probable; this would indicate treatment by the tampon. On the other hand, the persistent hemorrhage called for suture of the ruptured uterus. With the idea of accomplishing all that could be done by both, the rent in the uterus was stitched *per vaginam* through the greater portion of its extent. A long glass tube was passed through the rent into the abdominal cavity, and the vicinity of the rent irrigated with two per cent. solution of boracic acid. A Sims speculum was introduced, the borders of the rent seized with tenaculum forceps, and the greater part of the rent closed by suture. At the left angle of the rent an opening sufficient to admit two fingers was allowed to remain. The bleeding immediately stopped. Through this opening iodoform gauze was passed into the abdominal cavity, and the end allowed to remain in the vagina. The uterine cavity and that of the cervix were tamponed with iodoform gauze; this was allowed to remain for four days, when it was removed and the vagina tamponed with fresh gauze. In eight days the tampon was removed from the abdominal cavity. The patient suffered from mastitis, but otherwise made a good recovery. Cholmogoroff draws attention to this combined method of treating complete rupture of the uterus as combining the advantages of both cœliotomy and the use of the tampon.

THE INDUCTION OF LABOR IN CONTRACTED PELVES.

BEUTTNER (*Archiv für Gynäkologie*, 1895, Band xlviii., Heft 2) reviews thoroughly the modern literature of the subject, and adds an account of thirty cases in which labor was induced because of contracted pelves. His conclusions from his study of this procedure are decidedly in favor of the induction of labor when compared with other operative procedures. He would place primigravidæ and multigravidæ in the same category, regarding the history of a previous difficult labor in multigravidæ as of very little importance. He considers 10 cms. not too large a true conjugate to justify the induction of labor. The element of importance in deciding upon the operation is a comparatively slight disproportion between the size of the head and that of the pelvis; to determine this, he is convinced of the value of MÜLLER'S procedure, and would induce labor when the head of the child can be brought to engage in the brim of the pelvis only by long and vigorous pressure exerted externally and from above; to determine this fact accurately anæsthesia is often necessary. The duration of pregnancy and the supposed development of the fœtus at a given period are unreliable factors upon which to base an operative procedure.

TWO CASES OF SPONTANEOUS RUPTURE OF THE UTERUS.

In the *Centralblatt für Gynäkologie*, 1895, No. 2, GESSNER reports two cases of spontaneous rupture of the uterus. The first occurred in a multipara who had had easy labors. In the present instance a transverse presentation developed, with prolapse of the arm. While the attending physician was preparing to do version, the cord, which had prolapsed, suddenly ceased to beat; uterine contractions stopped, although hemorrhage was absent. The child was extracted and easily resuscitated, when it was found that a complete rupture of the uterus had occurred. The patient was at once transferred to the clinic of the University of Berlin, where cœliotomy was performed by Olshausen. Suture of the uterus and drainage by gauze tampon were employed. The patient made a good recovery.

Gessner's second case was that of a patient whose labor was delayed by hydrocephalus. The attendant physician had applied forceps, but failing to lock them, had desisted from making traction. Rupture of the uterus occurred, and the patient was transferred to the clinic, where the fœtus was easily extracted after craniotomy. In this instance it is doubtful whether the rupture was complete. It was treated by gauze drainage without cœliotomy. The patient made a good recovery.

In the first instance it is interesting to note that in transverse presentations as pointed out by Freund, it is not the uterine muscle which ruptures, but the attachment of the vagina to the uterus which is drawn away. The prolapse of the arm seems to be an important factor in such an accident. In the second case the rupture was typical of the variety described by Bandl, occurring at the junction of the upper with the lower uterine segment.

PÆDIATRICS.

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THE USE OF HIGH INTESTINAL INJECTIONS IN CHILDREN.

SSOKOLOW, of St. Petersburg (*Jahrbuch f. Kinderheilkunde*, Bd. xxxviii. S. 186), has made an extensive anatomical study of the intestines of children to determine to what extent the ileo-cæcal valve offers an obstacle to the passage of an injected fluid from the cæcum to the ileum. After noting the different positions of the rectum and the sigmoid flexure, which vary so frequently in children from the usual positions as found in the adult, he finds that the distance to which the tube is inserted does not materially affect the passage of fluid to the whole extent of the large bowel, provided a sufficient pressure be obtained. It is desirable, however, to reach the sigmoid flexure, in order to avoid over-distention of the rectum and consequent forcible expulsive efforts. The dorsal position, with thighs drawn up, and pelvis elevated, is found to be the most advantageous, and a pressure of not more than 1 to 1½ metres is advised.

Among 200 subjects experimented upon, 130 being under one year, it was found that the ileo-cæcal valve was competent in only 27 cases (20.8 per cent.), while in 103 (79.2 per cent.) water passed freely through the valve into the small intestine. In older children, from one to twelve years, insufficiency was not so common, since out of 70 cases 37 had incompetency. A pressure of more than 3 metres was dangerous, being liable to rupture the gut or disorganize the valve. It is, therefore, evident from this study that in children under one year fluid may be expected to reach the small intestine in three-fourths, and in older children in one-half of the cases. Therefore, in every suitable case an effort should be made to reach the small intestine with the irrigating fluid. Besides the numerous morbid conditions admitting of this treatment (dyspepsia, koprostasis, entero-colitis, cholera infantum, dysentery, etc.), the possibility of intestinal feeding, as Muselli has suggested, must not be overlooked. This is especially valuable in such conditions as trismus, laryngeal diseases or palsy of laryngeal muscles, dysphagia from stenosis of œsophagus, and diseases of the stomach where rest of the organ is demanded.

The Digestibility of Sterilized and Unsterilized Milk.

Bendix (*Jahrbuch f. Kinderheilkunde*, Bd. xxxviii. S. 393) has made the following interesting conclusions based upon experiments in feeding three children (aged one and three-quarters, two, and two and a half years) for equal periods (four days, six days, and seven days respectively) upon two dietaries differing only in the employment of Pasteurized or sterilized milk, the most rigorous estimation of ingesta and excreta being made in each case.

With a child in good health there is no difference in the assimilation of nitrogen or fat in favor of Pasteurized over sterilized milk, whence it follows that sterilized milk is as well digested and as completely absorbed as non-sterilized milk. But with a child whose digestion is weakened by diminished secretion of bile, assimilation is diminished, as compared with the normal, in the proportion of 0.9 to 2 per cent. for nitrogen, and 2.4 to 3.8 per cent. for fat; but it is diminished equally for the two varieties of milk. The taste and odor of milk remain good after sterilization, though differing decidedly from that of raw milk; but it is taken as readily as Pasteurized milk.

Contrary to the opinion of Kalischer, the author has never found that the brownish color of sterilized milk is liable to cause young children to refuse it. He has never seen sterilized milk produce the slightest disturbance of digestion; on the contrary, the general condition and appetite have been good, the stools normal, growth regular, and vomiting never occurred.

On the other hand, since sterilization prevents every danger of transmitting grave diseases by destruction of pathogenic microbes, while it prevents other diseases, especially of the intestines, by destroying the germs of fermentation and decomposition, the physician should insist upon its use in preparing milk for the artificial rearing of infants. Sterilization is preferable to Pasteurization, since the latter does not insure so completely the destruction of bacteria, especially the spores.

A Floating Kidney in an Infant.

In the course of a paper on floating kidney William W. Stewart (*Medical Record*, February 9, 1895, p. 163) reports a case accidentally encountered in an infant of eight months. The child had swallowed some pieces of plaster, and intestinal obstruction followed. After thirty-six hours of ineffectual treatment the author was called upon to operate. Though the abdomen was quite tympanitic, a distinct movable tumor could be felt on the right side halfway between the crest of the ilium and the umbilicus. Its exact consistency and shape could not be made out. This tumor was believed to be the obstructed gut. The mother was questioned carefully, but stated she had never before noticed the tumor, which she could now feel with the greatest ease. Upon opening the abdomen the tumor was found to be a floating kidney, while the obstruction was located in an intussusception in the left hypogastric region. The child had never suffered any inconvenience from the kidney. The author believes this to be the youngest case of floating kidney yet reported.

TRIONAL AS A HYPNOTIC FOR CHILDREN.

CLAUS (*Internationale klinische Rundschau*, 1894, No. 45, p. 1613) makes a report of his experience with trional as a hypnotic for children. Given in doses of three grains to twenty two and one-half grains, according to the age of the child, he has found this drug a reliable hypnotic, producing a physiological sleep and leaving no headache or heaviness on the following morning. The patient does not become accustomed to its effects. Sleep is usually produced ten to fifteen minutes after ingestion. In painful conditions its influence is not very satisfactory. Upon the intellectual, respiratory, and circulatory functions its action is negative. One instance, however, is mentioned in which, in a case of broncho-pneumonia in a child of five years, a single dose of eleven grains produced ataxic symptoms. The most satisfactory results were obtained in cases of chorea and pavor nocturnus, and in insomnia from disturbances of dentition or of digestion. In several cases of the latter class the influence of the drug upon the digestive functions seemed beneficial. This agrees with previous experience in the use of trional among the insane. The dose from one month to one year is three to six grains; from one to two years, six to twelve grains; from two to six years, twelve to eighteen grains; and from six to ten years, eighteen to twenty-two and one-half grains. It is best given half an hour after the evening meal, or fifteen minutes before bedtime. It can be given in hot milk, or in confection or honey.

BURSAL ENLARGEMENTS AS INDICATIONS OF INCIPIENT TUBERCULOUS ARTHRITIS.

D'ARCY POWER (*British Medical Journal*, 1894, ii. p. 412) calls attention to the importance of bursal enlargements in the neighborhood of the hip-joint in children. Such cases at the time show no evidence of affection of the joint. There is no limp, no pain, no muscular fixation, and the head of the bone moves freely in the acetabulum. Yet such bursal enlargements are of very serious import and are of great diagnostic value, for they frequently are the first indications of tuberculous mischief occurring in a patient who otherwise appears sound. The tuberculous trouble thus starting in the bursa will spread rapidly to the joint, unless care be taken to prevent it. In support of this six cases are reported, taken from the records of the Victoria

Hospital for Children during the current year. If so many cases have come under the observation of a single surgeon in a comparatively short time, the author believes they cannot be of infrequent occurrence, but very little reference to the condition can be found in most text-books. If the effusion into the bursa be seen before suppuration has occurred, the fluid should be evacuated by incision rather than by aspiration. If suppuration has occurred, the abscess must be opened, scraped, thoroughly cleansed, and every effort made to get it to heal at once. Suitable precautions are to be taken at the same time to secure physiological rest for the joint, while the general hygiene of the patient must be improved, for it must not be forgotten that the patient has already passed the threshold of tubercular disease. The drainage-tube should be dispensed with, in order to obtain union by first intention.

PATHOLOGY AND BACTERIOLOGY.

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Osteomyelitis.

Closely associated with the problems of suppuration are those connected with the etiology of acute osteomyelitis. It, too, was at first supposed to be a specific disease of the bone-marrow, and Becker consequently designated the micrococcus which he discovered in the pus the "osteomyelitis coccus." A very careful article, from the pen of Max Jordan (*Beiträge z. kl. Chirurg.*, 1893, x. 585), reviews the whole subject from the bacteriological point of view, and adds to the cases of osteomyelitis previously reported nineteen of his own, in all of which bacteriological examinations were made.

Histologically acute osteomyelitis is usually a purulent inflammation, occasionally it is of a serous or of a hemorrhagic-septic type. Notwithstanding this the identity of these forms is shown by their identical etiology and similar clinical type. It is almost always a secondary process, though the primary focus of inflammation may have disappeared before the onset of symptoms of osteomyelitis. In these cases the osteomyelitis is frequently mistaken for the primary disease. Its onset is not infrequently very insidious. It usually affects first the ends of the long bones at or near the line of junction of epiphysis and diaphysis, and is almost exclusively a disease of the period of bone development, its rare occurrence in adults being explained by the fact that in them the special conditions predisposing to the disease during the growing stage of the bone have ceased to exist.

As a number of quite distinct species of bacteria have been found associated with osteomyelitis it is evident that Becker was wrong in supposing it to be a specific disease. It is most often caused by the *staphylococci*, aureus, albus, or both, but may be caused by the *streptococcus pyogenes*, by the *pneumococcus* of Fränkel, or by the *bacillus typhosus*. It has been produced experimentally in animals by the soluble products of these bacteria and also by purely chemical irritants. The paths of entry of these germs into the body are the same as in other infectious processes—through the alimentary tract, the respiratory tract, or the skin. A number of interesting cases are given by Jordan in which osteomyelitis occurred secondarily to boils, whitlows, and other comparatively insignificant lesions of the skin which ordinarily attract but little attention. In many of these cases cultures showed the same species of bacteria in the original skin lesion and in the osteomyelitic pus.

As far as etiology is concerned, then, acute osteomyelitis stands in the same relation to its cause that suppurative inflammation in other tissues occupies to the same causes acting on them. Since it is almost invariably secondary and is often associated with a number of other suppurative lesions in widely separated parts of the body, Jordan considers it just to regard it as part of a purely bacterial form of pyæmia which shows a great disposition during youth to the formation of metastases in the bones because of a peculiar predisposition afforded by them during the developmental period.

MIXED INFECTION IN PULMONARY TUBERCULOSIS.

Notwithstanding the proof of Fränkel and Troje (AMERICAN JOURNAL OF THE MEDICAL SCIENCES, June 1894, p. 744) that the tubercle bacillus alone is quite competent under proper conditions to produce pulmonary tuberculosis of the most diffuse nature, the impression has steadily grown that in very many cases of phthisis a "mixed infection" occurs at some time in the course of the disease, and that an important *rôle* in determining the progress of the disease is played by the bacteria causing the associated lesions at such times. This impression has had its foundation in the frequent clinical observation of exacerbation of chronic phthisis during and after influenza, lobar pneumonia, and after the various complicating broncho-pneumonias, as, for example, after the broncho-pneumonia of measles in children. It has been suggested that were it not for the contributing conditions of the mixed infection the body would be able to protect itself in a very large proportion of cases from encroachment of the tubercular process. Whether this latter extreme view be correct or not, it becomes of the greatest importance from both prophylactic and therapeutic standpoints to determine the germs most frequently contributing to the progress of the tubercular process, and to investigate the most efficient means of lessening their influence.

With a view to throwing light upon the first of these questions, SPENGLER, working at the Institut für Infectionskrankheiten, in Berlin, under Koch's guidance, has examined the sputum of fifty patients suffering from phthisis, using every precaution to exclude any sources of error. (*Zeitschr. f. Hygiene u. Infectionskrankheiten*, 1894, xviii. 343.) Stained cover-glass preparations of the sputum and cultures from it by both Pfeiffer's and Kitasato's methods were carefully studied, and careful microscopic and bacteriologic examinations of the diseased organs were made in all the fatal cases. In only five of the fifty cases studied was the tubercle bacillus alone found. Three of these died, and in the lesions of all the tubercle bacillus was alone.

In nearly eighty per cent. (39) of the cases the *streptococcus pyogenes* was associated with the tubercle bacillus, and in twenty-one of these the streptococcus was believed to have been an active agent in the production of the lesions, because of its presence in large numbers in the sputum coincidently with the occurrence of fever of a peculiar type, and because of its presence in the lesions post-mortem. In fifteen cases the streptococcus appeared to be present as a passive accompaniment of the tubercle bacillus. In these there was comparatively little fever, the progress of the cases was very slow or stationary, and in the majority the streptococci seemed to be present as a residue of an acute condition which had subsided some time previously. Eight of these cases had had the advantage of a residence at Davos, in the Tyrolean Alps; and Spengler suggests that the benefit therefrom depended chiefly upon the rapid recovery from the associated affection, the streptococci in all these cases quickly diminishing in numbers, and in several of them ultimately disappearing entirely from the sputum.

The *diplococcus pneumoniæ* was found to be the associated germ in one case, and in one each the *micrococcus tetragenus*, the influenza bacillus and the pseudo-influenza bacillus were associated with the streptococcus.

The important practical deduction from this work is that in the prophylaxis and the treatment of tuberculosis of the lungs careful consideration should be given to the part played by the associated bacteria. Persons affected with slight or transitory inflammations of the respiratory tract should be removed as far as possible from all sources of infection by the tubercle bacillus; they should under no circumstances be placed in the same wards in hospitals with consumptives. Similarly, great care should be used to exclude from persons already affected with tuberculosis all sources of infection with the bacteria which have been shown to exert so deleterious an influence upon the progress of the disease. This would seem to be best accomplished by the removal of the tubercular patient to a high mountainous region, or to one at all events where the air is free from the germs of suppuration and pneumonia. And, furthermore, in the treatment of cases of phthisis, the first care of the physician should be to rid the lungs as quickly as possible of the associated bacteria, for so long as their hurtful influence continues it is useless to institute specific treatment of the tuberculosis.

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A CONTRIBUTION TO THE SUBJECT OF TUMORS OF THE SPINAL CORD, WITH REMARKS UPON THEIR DIAGNOSIS AND THEIR SURGICAL TREATMENT, WITH A REPORT OF SIX CASES, IN THREE OF WHICH THE TUMOR WAS REMOVED.[1]

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Introduction. The diagnosis of tumors of the spinal cord has only become possible with any degree of accuracy within the past few years, since the localization of motor and sensory functions of the spinal cord has been precisely determined. The practical importance of a subject of this character cannot be exaggerated, inasmuch as a study of the cases upon record shows that a relief of the symptoms and a cure of the disease are perfectly possible by surgical interference in certain cases, when the diagnosis is made in time.

From a careful review of the literature of the past ten years I have been able to collect 123 cases of tumor of the spinal cord. In Pepper's *System of Medicine*, in an article by Mills and Lloyd, published in 1886, 50 cases are tabulated. In an article by Gowers and Horsley, *Transactions of the Medico-Chirurgical Society of London*, 1888, 58 cases of spinal tumor are collected, 12 of which are included in the collection of Mills and Lloyd. Since the publication of these articles 27 reports of cases have appeared, which are cited in this article, making the total number of tumors of the cord which I have been able to collect 123.

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[1] Read before the New York Neurological Society, January 8, 1895.

In 100 of these cases the history is fairly satisfactory, and in the light of our present knowledge a diagnosis of the disease should have been quite clear some time before death. In 54 cases it should have been possible to reach not only a diagnosis of the case, but also a conclusion as to the feasibility of an operation. Studying the cases from a pathological standpoint, I find of the 100 cases there were 75 in which the tumor could have been removed.

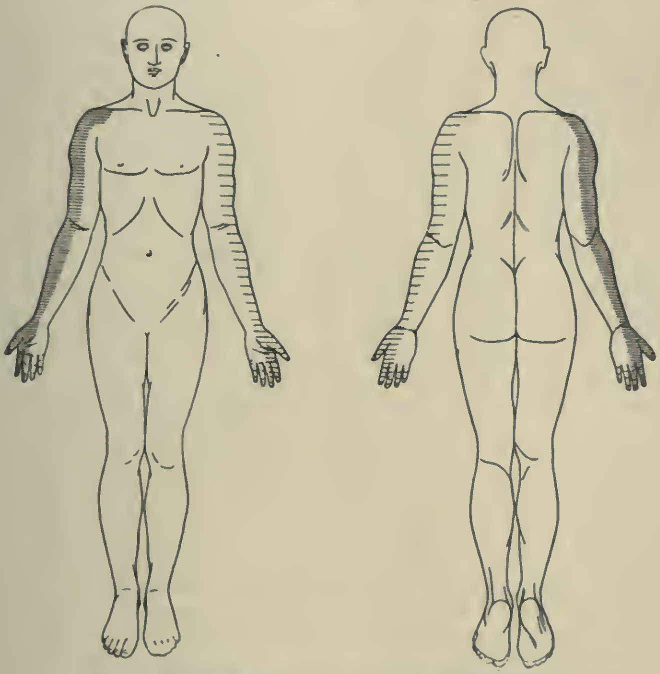
As a matter of fact, operations have been undertaken for the relief of tumor of the spinal cord in 22 cases. These are not included in the 123 cases referred to, but will be considered separately. In only 2 have surgeons failed to find the tumor sought for. In but 1 was it impossible to remove it when found. In 11 cases the patients have died soon after the operation. In 11 cases they have recovered from the operation. The operation has been followed by recovery from the condition of paraplegia in 6 cases. While the analysis of these cases shows that the results so far have not been very favorable, I think it can be proven that this is due to the fact that the diagnosis has not been made sufficiently early in the disease, and hence the question of operation has not been given the consideration it deserved. Even ten years ago Mills and Lloyd, in their article upon this subject in Pepper's *System of Medicine*, declared that "operations have offered even less hope than in brain-tumor, but in very rare cases should be taken into consideration." While experience hitherto appears to lend some support to this assertion, yet I hope to show in this paper that an early diagnosis of spinal tumor is possible; that the nature of tumors growing in the cord is such that the vast majority are capable of removal without injury to the cord; that the operation in itself is not one of great danger; and that in future its statistics should show recovery in a much larger proportion of the cases than they do at present.

Record of Personal Cases.

CASE I. *Carcinoma of the cervical region of the cord, secondary to carcinoma of the pancreas; autopsy.*—Female, forty-six years of age, whose mother died of cancer, began to suffer in August, 1892, from pain in the right shoulder and arm of a severe shooting character, which increased in intensity in spite of all treatment, and soon extended into the right side of the neck. After about two months severe pain appeared in the left shoulder and arm, and then a loss of power and atrophy in all the muscles of the shoulder-blades and arms commenced and progressed rapidly. From the first there was a considerable amount of numbness, which increased to a condition of anæsthesia in the outer side of the right arm and hand, involving thumb, index, and one-half of the middle finger. By the end of the third month of the disease she was completely unable to hold up her head, on account of the loss of power in the muscles of the neck and trapezii, so that the head fell in any direction when not supported, and any movement of the head gave her most intense pain in the neck and down the arms. The movement of the head and neck seemed to be impeded, though there was no deformity present, and the degree of stiffness could hardly be determined because of the intense agony which any motion of the head produced. During the third month of the disease power in her left leg became very much impaired, so that she could not walk or stand.

I saw her in consultation on December 17, 1892. Examination showed no affection of the cranial nerves; the pupils were equal and acted to light, and there was no appearance of any affection of the cervical sympathetic. She was lying in bed, with her head supported by pillows, and any movement of the head and neck caused great pain. When she sat up in bed it was necessary for the nurse to support the head by both hands, and even when thus supported the motion of sitting up gave rise to great agony; there was no deformity of the neck; there was extreme atrophy in both trapezii, in all the muscles of the shoulder-blades and arms, and some atrophy in the muscles of the forearms, but very little in the hands. It was impossible for her to move the arms at the shoulder-joint or at the elbow, but voluntary power in the fingers was possible, pressure, however, being incapable of moving a small, weak dynamometer more than ten degrees on the right side and twenty degrees on the left. There was a reaction of degeneration in the atrophied muscles; anæsthesia was present in both arms, more marked in the right arm upon the outer surface, involving two fingers and a half. (See Fig. 1.) The

FIG. 1.



Areas of anæsthesia in tumor of upper cervical region.
The relative degrees of anæsthesia are shown by the degree of shading.

power in the legs was weak, much more so in the left leg, and knee-jerk in the left leg was much increased, and there was ankle-clonus; there was no sensory disturbance of the trunk or legs; the control of the sphincters was perfect. At the time I saw her there were no symptoms pointing to disease in other organs of the body, though she had had some vomiting which had been ascribed to the necessary use of opium, which relieved the pain. Her progressive emaciation during her illness suggested the existence of malignant growth in some organ.

Diagnosis. The diagnosis made was pressure upon the upper portion of the spinal cord, probably from a new growth, possibly from a pachymeningitis, and an unfavorable prognosis was given. Four days later she developed jaundice, which led to the suspicion of a deep-seated growth involving the liver. She became rapidly exhausted, and died on January 11th.

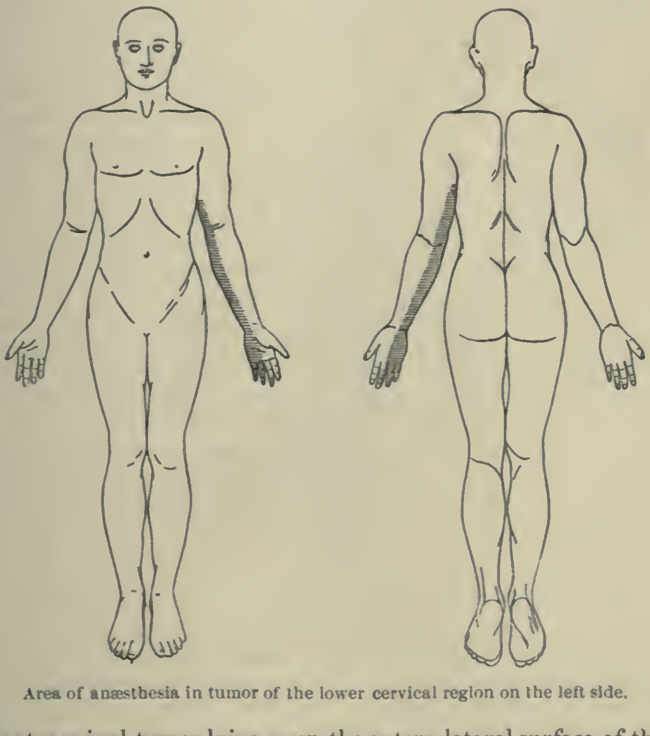
Autopsy. Autopsy showed a scirrhus cancer involving both lobes of the liver, the head of the pancreas and mesenteric glands, with small secondary cancers in the peritoneum, spleen, and ovaries. No examination of the spinal cord was made, but it seemed evident from the history and from the post-mortem examination that there must have been a secondary cancer of the spine pressing upon the spinal cord and involving the third, fourth, fifth, and sixth segments in the cervical region.

CASE II. *Gumma of lower cervical cord; recovery under treatment.*— The second case will be fully reported by my assistant, Dr. Norrie. A summary, however, may be given here, and is as follows: A man, about forty years of age, applied to the Vanderbilt clinic in October, 1894, with a history of having suffered from severe pain in the region of the left shoulder-blade, and progressive atrophy and paralysis of all the muscles about the shoulder-blade and of the left upper extremity. The pain had been most intense, and had not been relieved by counter-irritation or by any measure of treatment. The paralysis has advanced steadily, so that when he came to the clinic he was unable to lift his arm from the side. His power of flexion at the elbow was very weak, and all motions of the fingers and wrist were imperfect. There was great atrophy in the supra- and infra-spinatus, in the pectorales, in the deltoid biceps and triceps, and in the muscles of the forearm and hand. The most extreme atrophy was in the muscles of the hand, and in all of these there was a reaction of degeneration; in the other muscles the electric contractility was much diminished both to faradism and galvanism, but there were no polar changes. He had a sensation of numbness over the inner half of the hand and forearm, and in this area there was an objective anesthesia. (See Fig. 2.) In addition to these symptoms there was an evident invasion of the cervical sympathetic; the eye appeared smaller than that of the other side, the lid not being so fully opened, the pupil did not react so promptly to light as on the other side, and he had noticed during the summer that there was no sweating upon the right side of the face. There was some disturbance in his gait, and a marked exaggeration of tendon-reflexes at the knee, but no clonus. There was no anæsthesia upon the body.

It seemed evident that in this case there was present a disease affecting the left half of the cervical region of the cord from the fourth cervical to the first dorsal segments. That the disease lay within the spinal canal and not in the brachial plexus of nerves appears to be proven by the involvement of the cervical sympathetic, it having been shown by

Klumpe that when a lesion is limited to the brachial plexus the cervical sympathetic is never invaded.[1] The absence of symptoms of Brown-Séquard paralysis below the level of the cervical cord seemed to indicate that the disease lay outside of the cord rather than within it, and involved, in all probability, the nerve-roots within the dura upon one side of the cord at their exit. It also seemed probable from the predominance of motor over sensory symptoms that the anterior roots were more decidedly affected than the posterior. The diagnosis, therefore, was made of an extra-spinal tumor lying upon the antero-lateral surface of the cord and extending from the fourth cervical to the first dorsal segments, with its maximum antero-posterior extension in the lower portion, inasmuch as the more severe symptoms were limited in distribution to the seventh and eighth cervical segments. In regard to the nature of this tumor there was considerable doubt, but the fact that the man had had syphilis gave probability to the idea that the growth might be of a gummy nature. He was, therefore, put at once upon inunctions of mercury and upon large doses of iodide of potassium. A marked improvement in the sensory symptoms was manifest within two weeks, and under the use of electrical treatment the paralysis also began to subside, so that at the end of five months this man's condition is very greatly changed; his pain has entirely disappeared, but he still has some numbness and anæsthesia

FIG. 2.



Area of anæsthesia in tumor of the lower cervical region on the left side.

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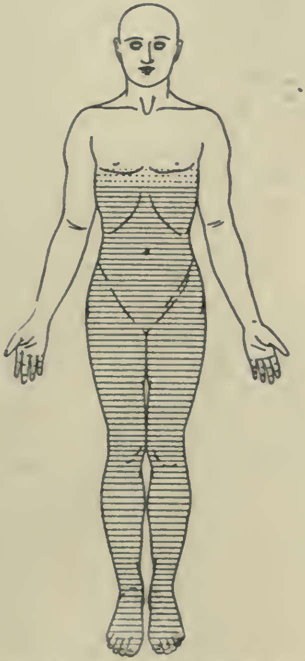
[1] Rev. de Médecine, 1885, Nos. 7 and 9.

in the inner half of the hand and forearm as high as the elbow. He is able to use his right arm at present fairly well and to lift it to his head, and can move all the fingers much more freely than before, so that at present he is fairly capable of doing his work; all pain in the back has subsided, but there has been no change in the appearance of the face and eye or in the condition of perspiration upon the face. I think the course of the case has confirmed the original diagnosis, so that it may be stated that the gumma has been absorbed.

CASE III. *Sarcoma of the spinal cord in the dorsal region; removal; death; diagnosis by Dr. Henry Hun; operation by Dr. McCosh.*—The third patient was a male, aged forty-two years. His father died of sarcoma of the eye. His mother and a brother died of phthisis. He was perfectly healthy until April, 1893. His occupation required continual standing. His first symptom was a feeling of formication over the abdomen and pain in the right side and in the epigastrium, and later in the right shoulder-blade. This pain was of a neuralgic character, quite severe and often burning. One week later he noticed a weakness in both legs, and found that he could not walk with ease or come down stairs; at the same time he began to feel some numbness in his legs and a sensation of heat in the thighs and back and under the right shoulder-blade. This sensation of heat occasionally alternated with a sensation of cold, but any sudden movement, like that of coughing, produced the sensation of heat; soon after he noticed in addition to these sensations a constant tingling in the entire body below the level of the epigastrium and in both legs. In the latter part of May, when I first saw him, these symptoms were all increasing, and he felt not only the lack of power in the legs but also in the abdomen when at stool; there was no disturbance of the bladder, but he was unusually constipated; his gait was decidedly spastic; his knee-jerks were much increased, and there was ankle-clonus. Slight anæsthesia was found below the level of the seventh dorsal nerve, and appeared to be about equal upon both sides. The diagnosis made at this time was a transverse myelitis at the mid-dorsal region of obscure origin, but the further progress of the case led Dr. Hun to come to the conclusion that the cause of the myelitis was a tumor, for the symptoms rapidly increased during the summer and fall of 1893 in spite of various forms of treatment, including rest, mercurial inunctions, large doses of iodide, and hydrotherapeutics. Pain was a very marked symptom both in the back and around the body at the level of the seventh dorsal nerve, and was increased by motion. As the paralysis increased reflex spasms of the legs became more and more frequent; the legs being forcibly extended, and becoming very rigid upon any irritation of the skin, on tapping the tendons, or on making any attempts at walking. The anæsthesia gradully increased until it became total; its upper limit behind being the seventh intercostal space, and in front at the ensiform cartilage. Pain and temperature sensations were felt three inches below this line. For two inches above this a band of decided hyperæsthesia gradually developed. There was no paralysis of the sphincters and no bedsores, but the skin below the middle of the thighs was glossy. The bladder emptied itself three or four times a day.

The progress of the case making the diagnosis of a tumor about the seventh dorsal segment of the cord quite certain, Dr. Hun sent him down to the Presbyterian Hospital for an operation. An examination on February 22, 1894, showed a total paraplegia below the level of the seventh dorsal segment, with extreme rigidity and increased reflex excitability in all the muscles of the legs and back; there was some difficulty in respiration, its rate being 24, and the abdominal muscles were entirely paralyzed. His temperature was normal and pulse about 108. Knee jerks were high, ankle-clonus marked, but there was no cremasteric or epigastric reflex. Sensation was the same as that already described.

FIG 3.



Area of anæsthesia in tumor of the seventh dorsal segment.

On March 6th Dr. McCosh operated, removing the spines and arches of the third, fourth, fifth, and sixth dorsal vertebræ; under the arch of the fifth dorsal vertebra outside of the dura a soft lobulated vascular tumor, subsequently ascertained to be a sarcoma, was found, about an inch and a half in length, lying chiefly upon the posterior surface of the dura mater, and rather thicker upon the right side. It nearly surrounded the cord; this was removed with a sharp spoon. The operation was attended with considerable hemorrhage, as the man was very large and muscular, and subsequently to the operation respiration became very weak, his temperature rose to 102°, and his pulse became very feeble. Twitching of the muscles of the body and legs caused much discomfort. In the course of a few days, however, he appeared to recover from the shock of the operation, but the removal of the tumor had apparently caused no change in the symptoms of paraplegia. During the following two weeks he gradually failed in strength, was frequently delirious, had increasing difficulty in respiration, had constantly a febrile temperature, although the wound was perfectly clean and healed promptly; he gradually became more and more exhausted, and on the 21st of March, seventeen days after the operation, died of heart-failure. The post-mortem examination had to be limited to the cord, and showed that the tumor had been entirely removed. His death was ascribed to the existence of other sarcomata in the viscera producing exhaustion, but this could not be confirmed.

CASE IV. *Tumor beginning in the lumbar region and involving the sacral region and cauda equina; autopsy.*—A young woman who had previously been in pretty good health, suffered for several months from backache, and then was suddenly seized with severe pain in the upper lumbar and lower dorsal region, which was much increased by motion and by lying down, and which was followed by pain down the left leg in the sciatic distribution. Three months later a slight swelling appeared at the level of the third lumbar vertebra, which gradually disappeared in the course of a month; its nature was not discovered. While this swelling was present she suddenly lost the sensation of heat and pain in the left leg. Six weeks later she lost the power of motion in the right leg, excepting in the foot. A month after the left leg also became paralyzed and anæsthetic, and finally one month later the right leg became also anæsthetic. Thus in the course of four months a gradual progress from a Brown-Séquard paralysis to a total paraplegia occurred. Early in the disease retention of urine and obstinate constipation appeared and continued. I saw her one month after the development of the paraplegia. The condition found was as follows:

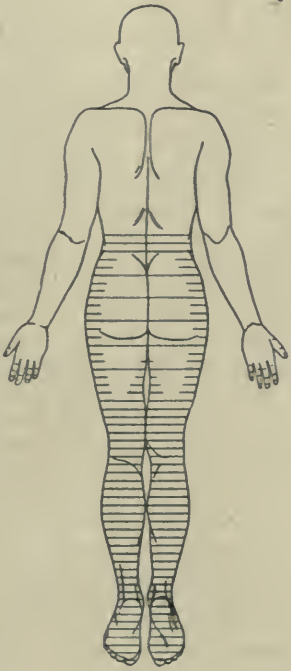
Motion. There was total paralysis of all the muscles of the legs, abdomen, and back below the level of the upper lumbar vertebra; all reflex action was lost; there was a marked atrophy of the muscles of the pelvis and thighs, and in these muscles the faradic reaction was lost. The muscles below the knees were less atrophic and the faradic reaction was preserved. The galvanic reaction was changed in the thigh muscles, anode and cathode producing equal contractions, while in the muscles below the knee the cathode closure contraction was greater than the anode closure contraction. The limbs were flaccid without rigidity, and spasmodic contractions, which had been present at first, had wholly ceased.

Sensation. There was a loss of sensation to touch, temperature, and pain below a line passing about the body at the level of the first lumbar vertebra on the back and over the abdomen, excepting upon a saddle-shaped area over the buttocks, as shown in the diagram (Fig. 4), where sensations were only slightly diminished. This area of good sensibility included the vagina, anus, and perineum. A year later this area had also lost its sensibility and the anæsthesia of the lower extremities was complete. The area which retained its sensibility is that which corresponds to the sacral region of the spinal cord, and hence from this peculiar distribution of the anæsthesia it was evident that the sacral cord was not invaded by the disease or destroyed as early as was the lumbar cord. Inasmuch as lesions of the cauda equina producing compression uniformly cause sensory symptoms referable to the sacral nerves prior to those referable to the lumbar nerves of the cauda, we have in this progress of the symptoms a proof that the lesion began in the lumbar region and afterward affected the sacral region and the cauda.

Trophic symptoms. There was a glossy appearance of the legs; there was a very marked tendency to bedsores, so that a change of position every hour was necessary; there was a slight cystitis.

Automatic action. In the early part of the case the bladder was under no voluntary control, urine being retained until drawn, or passed suddenly when the bladder became full without control of the patient. The evacuation of the rectum was difficult and painful, the sphincter ani offering resistance. Later in the disease there was total paralysis of both sphincters. There was no deformity of the back, but there was marked tenderness over the third lumbar vertebra, and pain was produced by any motion of the body on the hips.

FIG. 4.



Area of anæsthesia in tumor of the lumbar region.
Sensations from the sacral segments were but slightly affected.

This patient lived for two years and two months after the beginning of the Brown-Séquard symptoms, and then died suddenly. The autopsy showed the existence of a soft tumor extending from the first lumbar segment of the cord downward and involving both the cord and cauda equina and filling the entire dural sac.

This patient was seen by me but once in consultation at a distance from New York, and though a tumor was suspected, yet an operation did not seem feasible. The specimen was badly preserved, and reached me in such a condition that no microscopic examination could be made. I regret that the report of the tumor is so imperfect, but its existence was assured.

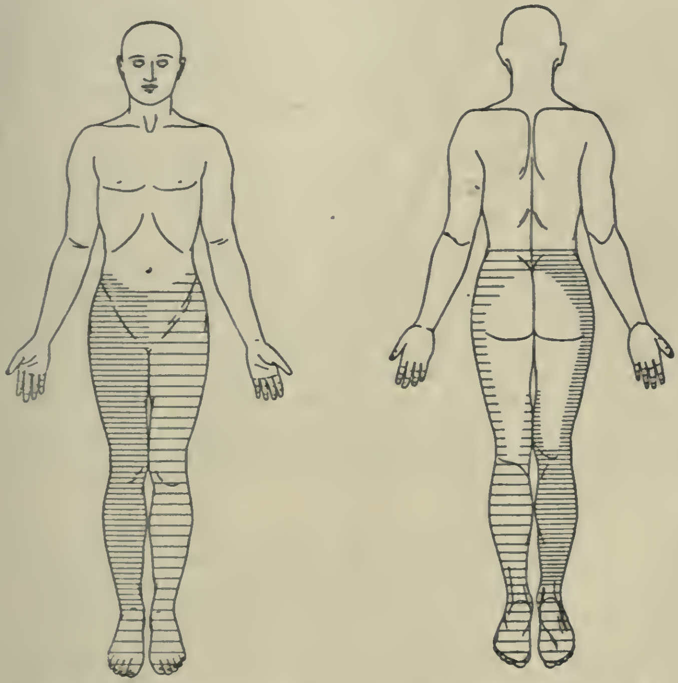
REMARKS. Looking back upon the case in the light of the autopsy it is evident that at the time when the patient was seen by me the destruction of the lumbar region of the cord had already occurred by the tumor, as shown by the reaction of degeneration and atrophy in the muscles of the thighs. That the cord was not wholly destroyed, however, but was capable of conducting impulses of sensation from the sacral segment through the diseased portion, was evident from the persistence of sensation over the buttocks. It is probable, therefore, that had an operation been undertaken at the time this patient was seen the tumor could have been removed, and thus further progress of the symptoms been averted. Whether the nature of the tumor was such that a recurrence would have occurred must be left undetermined.

CASE V. *Lipoma of the lumbar region of the cord; operation; removal; caries of the dorsal region; death.*—Female, aged fifty years, came into the Presbyterian Hospital February 1, 1894, for the relief of a chronic painful swelling of the right knee, for which she was operated upon by Dr. McCosh, who removed a fatty and granular mass and considerable clear fluid from the knee-joint on February 15th. The wound had healed by February 26th, leaving the patient with much better use of the joint than prior to the operation. The examination of the patient upon her entrance revealed another condition independent of the affection of the knee-joint, which led to the diagnosis of a tumor of the spinal cord. She said that she had been suffering for four months from severe attacks of pain on the right side of the abdomen which occasionally seemed to extend over the entire abdomen. She had also had a drawing pain in the right thigh down the front of the thigh, and considerable muscular twitching in the right thigh and leg. She said that since the first of January these pains had extended to the left side of the abdomen and into the left leg, but were less severe than in the right. In addition to the pain she had noticed a diminution of touch and pain sensations in both legs and feet, which was more marked upon the right thigh. Her right patella reflex was increased, and there was marked ankle-clonus. Frequent spasm of the flexor muscles of both legs gave her great distress, especially at night, and required the use of morphine. After her recovery from the operation upon the knee a more careful examination was made of the symptoms here described, and on March 1st, when I was called to see her, the following condition was found:

Pain. She had pain about the abdomen, sharp and shooting, and also down the legs, especially in the region of the anterior crural nerves. This pain was at times severe and was increased by any movement in bed; it was also increased by the spasmodic twitching of the legs, which occurred frequently.

Sensation. Partial anæsthesia to touch, temperature, and pain was discovered upon both lower extremities of a peculiar distribution. In the well-known saddle-shaped area over the buttocks and back of the thighs corresponding to the sensory distribution of the sacral region of the cord, there seemed to be good sensation, but over the gluteal region, above this area and down the outer side of the thighs and legs, and also along the inner side of the legs, the anæsthesia was well marked. It was much more intense upon the right leg than upon the left. The exact distribution is shown in the diagram (Fig. 5). On the front of the abdomen the anæsthesia extended as high as an inch below the umbilicus. It involved the front of both thighs and legs.

FIG. 5.



Area of anæsthesia in lipoma of upper lumbar region. Sensation preserved in sacral region.

Motion. There was loss of power in both limbs, more marked in the right than in the left. The muscles upon the anterior surface of thighs and the muscles of the pelvis seemed to be more affected than the muscles below the knees. She stood with great difficulty, could not walk without aid, and in the weakened muscles twitchings were quite constant. At times there was a tonic spasm of the muscles of the legs with spastic flexion of the thighs and legs. Since her entrance into the hospital she had been constantly constipated and had gradually developed bladder disturbance, consisting of retention of urine, which had to be relieved by a catheter. It was evident that in the past month during her stay in the hospital all the symptoms described had been progressively increasing; pain being worse; the anæsthesia more marked; the paralysis greater, and the sphincter trouble having developed.

Under these circumstances it seemed probable that this woman was suffering from a new growth compressing the spinal cord. The existence of a lipoma in the knee made it seem probable that a lipoma had developed within the spinal canal, either extra- or intra-dural. The situation of this seemed to be indicated by the sensory symptoms (see

Fig. 5). The distribution of the sensory disturbance pointed to the second lumbar segment of the spinal cord, as the highest point invaded by the disease; while the escape of the sacral segments as shown by the normal sensation over the saddle-shaped area rendered it probable that the tumor had not affected the sacral region of the cord. It seemed also probable that a tumor of the cauda equina could be excluded, because it is well-known that tumors pressing upon the cauda equina produce symptoms referable to the sacral rather than to the lumbar distribution of nerves. It was, therefore, resolved to operate for the removal of a lipoma from the region of the upper lumbar segments of the spinal cord.

Operation by Dr. McCosh. On March 29th Dr. McCosh operated, removing the spinal processes of the ninth, tenth, and eleventh dorsal vertebræ and the laminæ of the tenth dorsal vertebra. When the bone was removed, a soft yellow, fatty tumor was exposed beneath the tenth dorsal vertebra, extending entirely across the posterior surface of the dura, about one-half of an inch from side to side and three-fourths of an inch in length. After this was removed a probe was found to pass freely upward, but to meet with resistance from below. The laminæ of the eleventh dorsal vertebra were therefore removed, and a second fatty mass, similar in character and position to the first was found beneath it; the probe could then be passed downward freely. There was considerable hemorrhage at the time of the operation; but the patient recovered from it, and in the course of the following month the wound had entirely healed.

Examination two weeks after the operation showed little result excepting that the power over the bladder had returned and there was no longer any girdle-sensation about the abdomen. Pain, spasm, and anæsthesia appeared to be about the same as before the operation. By the middle of May the original condition had, however, returned and her sufferings were as great if not greater than before the first operation. Although the anæsthetic areas had not extended, the pain seemed to be somewhat higher up on the abdomen, being now above the umbilicus. It was thought, therefore, that possibly other tumors of the same character were compressing the cord at a higher region, and hence a second operation was undertaken on May 19th; the sixth, seventh, and eighth dorsal spines and lamina were removed, exposing a normal dura; the dura was incised, but nothing abnormal was discovered, and the appearance of the spinal cord was normal.

During this operation there was discovered, for the first time, a small non-inflammatory fluctuating swelling just below the level of the angle of the left scapula. After the spinal operation had been completed this little tumor was incised, and a surprising amount of pus immediately came out. When the finger was introduced into the cavity it passed between two of the ribs, which were found to be carious, and detected a roughened surface of the vertebræ. Inasmuch as the patient had had no temperature, had had no symptoms referable to the spine as high as the sixth dorsal vertebra, and had no tubercular history or appearance, the discovery of this condition of spinal caries was a surprise.

Subsequently to the operation pus was constantly discharged from the opening; she grew slowly but steadily weaker; the symptoms of pressure upon the cord gradually subsided; there were no longer muscular spasms; voluntary movement seemed to return gradually to some extent; sensations of pain and cold were perceived in the previously anæsthetic areas; the increase in the reflexes diminished, but the control of the sphincters remained imperfect; it was evident that all sensations were less keenly felt below the level of the eighth dorsal nerve than above it; she gradually failed in strength, and died September 1st.

REMARKS. It is difficult to determine in this case whether the symptoms described were originally due to the lipomata which were removed or to pressure exerted by the abscess higher up. In a case of Ransom and Thompson,[1] in which a tumor was removed from the sixth dorsal segment of the cord, pain was referred to the front of the thighs and legs in the distribution which corresponds to the second and third lumbar segments. In this case, however, there was also pain in the sixth dorsal nerve and evidences of paraplegia of dorsal origin, and the operation revealed the existence of a tumor in the dorsal region. Ransom ascribes the pain in the thighs in this patient to pressure upon the posterior columns of the spinal cord in the dorsal region where the tumor lay. Whether in our case a similar explanation can be given it is impossible to state; that many of the symptoms, however, were due to the pressure of the abscess is evident from the fact that much greater relief was obtained by its evacuation than by the removal of the small lipomata.

CASE VI. *Tubercular tumor of the spinal cord; removal by Dr. McBurney; partial recovery and recurrence.*—A. L., female, aged seventeen years, of tubercular family, was brought from the country to Roosevelt Hospital February, 1894, completely paralyzed in the lower extremities. The girl had been quite well until 1892, when she began to suffer with pain in the back about the level of the eleventh dorsal vertebra, which pain extended around the sides in the course of the dorsal nerves. This pain was very obstinate, and as time went on a kyphosis gradually developed until there was a marked elevation of the ninth, tenth, and eleventh dorsal spines, which had not been relieved by the use of plaster jackets or other apparatus. In spite of the curvature and of the pain she was able to be up and about until the latter part of December, 1893; then a numbness began in the left foot, extended to the right foot and up to the hip; a weakness of the legs soon developed, which increased quite rapidly, so that within four weeks she was paralyzed below the waist. In this condition she was brought to the hospital, where an examination revealed a prominence of the ninth, tenth, and eleventh dorsal vertebræ, with great pain upon pressure at this region, and inability to sit up in bed, and motor paralysis below the level of distribution of the tenth dorsal nerve. It was possible for her to move the toes slightly, but no movement at the ankle could be made. She could not draw her legs up, but when either thigh was flexed upon the abdomen a slight movement of flexion of the leg could be produced, but no extension of the leg at the knee. When lying on her back, if the thigh was raised at an angle of forty-five degrees a very slight flexion of it upon the abdomen was possible, but no extension of the thigh upon the body could be made.

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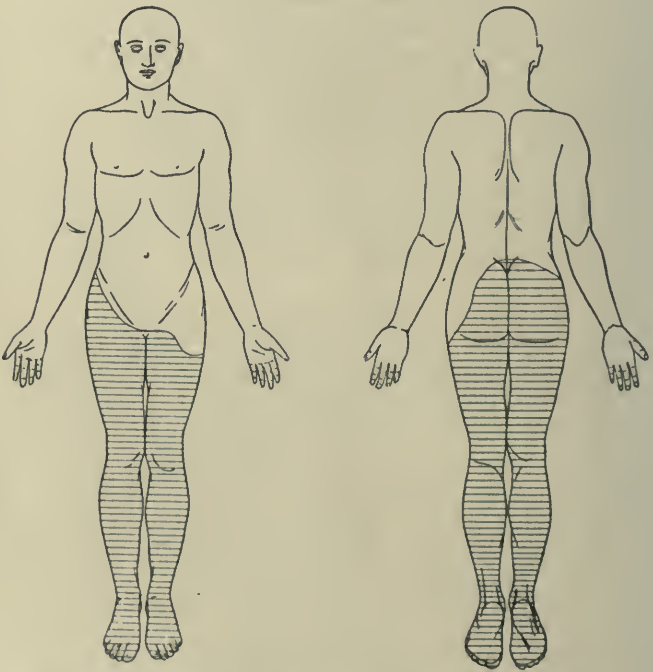
[1] Lancet, October, 1894.

No voluntary contraction of the abdominal muscles was possible, and there was partial paralysis of the bladder and rectum, so that at times retention had to be relieved by catheterization, and enemata had to be constantly used. The knee-jerks were very markedly increased, and there was ankle-clonus on both sides. The abdominal reflex was normal. Any irritation of the skin of the legs caused quick contractions, with sudden drawing up of both legs and flexion of the knees, which were entirely beyond her control, but which usually produced considerable pain. Sometimes any motion of the body would cause sudden forcible spasm with extension of thighs and legs. The condition of sensation was exceedingly interesting; there was partial anæsthesia to touch, temperature, pain, and loss of muscular sense in the legs and thighs. Across the back the line of anæsthesia ran about the upper level of the sacrum; in front upon the right side it followed the line of Poupart's ligament to the median line; upon the left side it was irregular in its distribution, sensation being preserved as low as the trochanter on the outer side of the thigh. (Fig. 6.) The anæsthesia was greater upon the outer side of the legs than upon the inner side; there was no anæsthesia upon the trunk or upon the back above the line indicated in the diagrams; the exact distribution of the anæsthesia is shown in Fig. 6, which was carefully prepared and confirmed by re-examination on several occasions.

FIG. 6.



Area of anæsthesia in tumor at the second and third lumbar segments.

Diagnosis. It was evident from the condition present that compression of the spinal cord was being made, producing a paralysis. The conclusion to be drawn from the distribution of the anæsthesia in this case was that upon the right side the second lumbar segment and upon the left side the third lumbar segment were compressed. As these segments lie opposite to the eleventh dorsal vertebra it was evident that the point at which the cord was compressed corresponded with the situation of the deformity. That this deformity was due to tubercular disease in the bodies of the vertebræ seemed likely, and yet the deformity had existed for nearly two years, while the paralysis had only existed for a month. It was thought probable that something more than a mere compression of the cord due to disease of the bones was present in this case. Inasmuch as medical treatment offered no promise of relief, and mechanical appliances had failed to correct the deformity or to prevent the onset of paralysis, it was determined to operate in order to remove, if possible, anything which might be found compressing the spinal cord at this region.

Operation by Dr. McBurney, February 9, 1894. When the spines and laminæ of the ninth, tenth, and eleventh vertebræ had been removed, a well defined incapsulated tumor was seen lying upon the dura mater outside the cord on its posterior and lateral surfaces, and extending around it upon the right side to the anterior surface; this had compressed the cord by pushing it forward upon the body of the tenth dorsal vertebra, and had also compressed the posterior nerve-roots at the eleventh dorsal nerve, though they were not destroyed. As the tumor was incapsulated it was perfectly possible to separate it from the dura mater and to dissect it up, thus relieving the cord from pressure. The tumor was followed round to the anterior surface as far as possible, where its extremity appeared to be continuous with tubercular caries of the eleventh dorsal vertebra. The wound was filled with iodoform and dressed antiseptically.

The patient recovered easily from the shock of the operation, and within four days a very marked improvement began to be evident, both in the condition of paralysis, of sensation, and of control of the bladder. This improvement advanced steadily during the following three weeks, by the end of which time she could produce voluntary motions of slight extent, but of some force, in both legs, and was able to perceive all sensations much more keenly than before the operation. There was a tendency to the formation of bedsores immediately after the operation, but these healed kindly under treatment, and the general nutrition of the skin appeared to improve. The wound healed by granulation, leaving only a small sinus running down to the bone. By the end of the fourth week she was able to sit up, then, after an indiscretion in diet, on March 18th, a sudden attack of gastritis occurred with vomiting, and in the course of a day all the symptoms of paralysis returned as before, with an increase of pain in the back and around the sides in the region of the eleventh dorsal nerve. The condition of the skin changed rapidly, so that there appeared to be danger of bedsores developing, and they were only prevented by the greatest care, constant shifting of the position and constant use of pillows. After an observation of ten days longer, during which the symptoms continued to increase, it was thought justifiable to undertake another operation, as it seemed likely that there had been a new development of tubercular tissue and a return of the compression. The second operation demonstrated that this supposition was correct, but unfortunately the general infiltration of all the tissues, soft and hard, in the region of the deformity and of the old wound, and about the spinal cord, made it impossible to relieve a second time the state of paralysis. The second operation was not followed by any improvement, although the wound healed by first intention. The girl was removed to her home, and died during the summer.

DIAGNOSIS. The comparative study of the cases collected and of those which I have brought together seems to warrant the following conclusions with regard to the symptomatology and diagnosis of spinal tumors:

First. The most important and earliest symptom of tumor of the spinal cord is pain. The location of this pain is usually in the peripheral termination of the nerve-root, which is first compressed by the growth of the tumor. Thus in the majority of cases the pain has been referred to the epigastrium or to the abdominal region, or to the legs or arms, rather than to the spine itself. The pain is of a severe neuralgic character, is sometimes described as a burning pain, and, as it increases, appears to shoot along the course of the nerve which is implicated. Inasmuch as it is a fact that the majority of tumors occurring in the spinal cord grow in the dorsal region it is evident that pain about the trunk is of a great deal of importance in the diagnosis of the disease. While such pain is unilateral at first, it soon becomes bilateral as the tumor grows, and this appears to be a very important point in diagnosis, for recently a case has been published from the Bonn Clinic,[1] in which a persistent pain in the course of the left sixth intercostal nerve, followed by a gradual development of paraplegia, led to the diagnosis of a tumor of the cord, which was shown at the operation and at the autopsy to be erroneous, there being in this case merely a persistent neuralgia of one sixth nerve and a myelitis not caused by pressure. The histories of a large majority of the cases of tumor collected show that the pain is rarely, if ever, limited to one side of the body in the stage when paralysis has developed, because when the tumor is large enough to compress the entire spinal cord it has necessarily invaded the posterior nerve-roots on both sides, and hence pain upon both sides of the body is inevitable. The exact situation of the initial pain is of a great deal of importance in locating the position of the tumor, and inasmuch as at present the peripheral distribution of sensory nerves is quite well understood, and the exact relation between each segment of the spinal cord and its sensory area upon the trunk or limbs is known, there should be little difficulty in locating the tumor from the seat of the pain. It is rather remarkable that pain, as a rule, is not felt in the spine itself; although it appears that when the tumor has grown to a sufficient size to produce pressure upon the dura mater and bone or to erode the bones of the vertebræ, that pain may be felt at the position of the growth. When pain is felt in the spine it is commonly located one or two inches below the seat of the tumor. Even when there is no pain in the spine it is not uncommon to find some tenderness upon pressure or tenderness upon percussion. I have not been able to ascertain that there was any difference in the percussion-note, as examined with the aid of the stethoscope, over the area of a spinal tumor, yet it would be well to examine further for this symptom when this condition is suspected.

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[1] Pfeiffer: Deut. Zeitschr. f Nervenheilk., 1891.

There appears to be no case of spinal tumor on record in which there was tenderness along the nerves in which the pain is felt. This appears to me to be a point of great importance in the differential diagnosis between the pain of neuralgia or neuritis and the pain produced by the disease under consideration, for in neuralgia, as is well known, we have definite painful points at the back, side, and front of the chest or body where the branches of the intercostal nerves make their exit through the fasciæ; and in conditions of neuritis, such as are frequently observed about the brachial plexus, or in the sciatic or anterior crural nerves, tenderness along the nerve trunks is a very marked symptom. Motion of the limbs or of the body in respiration will usually increase the pain in neuralgia or neuritis, while in spinal tumor, if the pain is produced by any movement, it is a movement which involves flexion or rotation of the vertebræ. The importance of this symptom of pain in the diagnosis of spinal tumor can hardly be exaggerated, because, as is well known, in ordinary myelitis not complicated by meningitis, pain is not a symptom, and, on the other hand, in a meningitis or in a myelitis with meningitis, the pain is very extensive in distribution, is not limited to a small region as in spinal tumor, and is attended by hyperæsthesia.

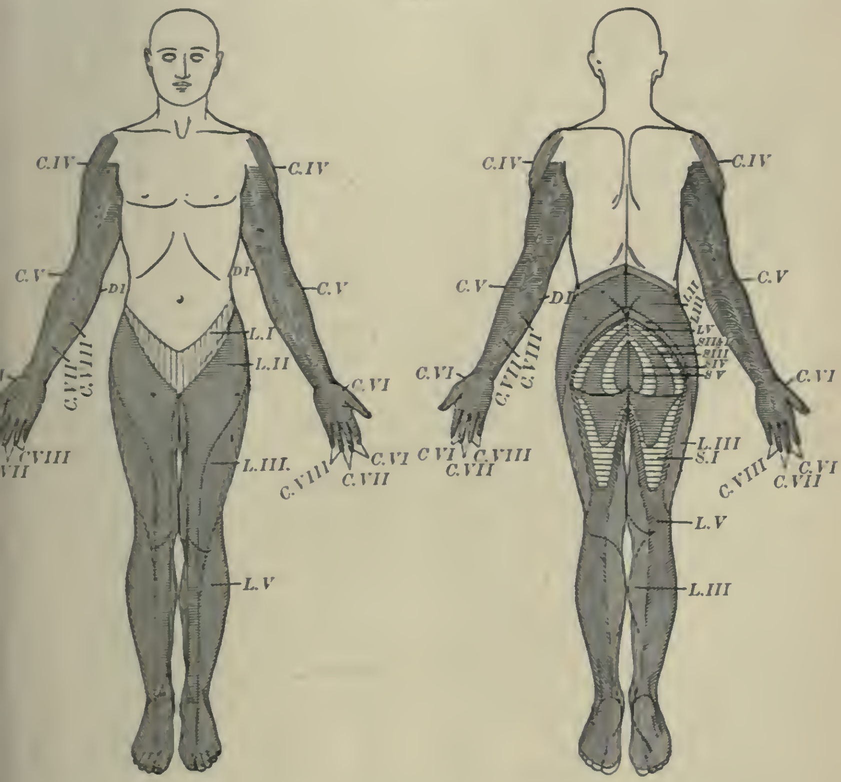
While, therefore, from the symptom of pain alone no one would attempt to make a diagnosis of a spinal tumor, yet when pain of the character described is added to the other symptoms of paraplegia now to be discussed the diagnosis of spinal tumor should be carefully considered.

Secondly. The second group of symptoms of diagnostic importance in connection with tumors of the spinal cord are those produced by the compression of the cord by the tumor. It is well known that when compression is exerted either upon a nerve trunk or upon the spinal cord, that *a certain order is commonly observed in the symptoms produced;* these are: First, pain referred to the periphery. Secondly, an increase of reflex activity in the segments below the point of compression. Thirdly, paralysis. Fourthly, a loss of sensibility; and fifthly, a loss of reflex activity. In the majority of cases of spinal tumor here collected this has been the order in which the symptoms were produced. In a very few cases, the tumor being situated entirely upon one side of the cord, the symptoms produced have been those of typical Brown-Séquard paralysis, namely: hyperæsthesia with paralysis on the side of the tumor, and paræsthesia followed by anæsthesia on the side opposite the tumor. Yet some cases of spinal tumor have been recorded both within the cord and outside of the cord in which the Brown-Séquard symptoms have not appeared, but in which the symptoms of total paraplegia have progressively advanced. The reason for the infrequency of Brown-Séquard paralysis in connection with spinal tumor is probably because the pressure exerted upon the cord, though it begins upon one side, is communicated to the entire segment involved, and hence a definite suspension of activity in one-half of the cord only is not common. The development of Brown-Séquard symptoms is far more frequent in intra-spinal than in extra-spinal or in extra-dural tumors.

A paraplegia advancing with greater or less rapidity is the common symptom to most spinal tumors. In the early stage there is paræsthesia with partial anæsthesia in the parts below the tumor. There is a sensation of weakness followed by actual paresis, and finally by total paralysis in the legs. There is in the early stage a great increase in the knee-jerks and ankle-clonus. Priapism is common. As the case goes on spastic rigidity of the legs and very violent contractions, which occur in extension or in flexion upon any irritation of the skin, muscles, or tendons, or during the evacuation of the bladder or rectum, form striking symptoms. Such spontaneous contractions also are produced by any movement of the body or rotation of the spine. They are painful, and do not, in my experience, occur so early or so severely in ordinary myelitis as they do in spinal tumor. In a majority of cases a loss of control of the bladder and rectum has been observed, but this varies somewhat in its character in accordance with the location of the tumor. If the tumor involves the lumbar and sacral regions of the cord, compressing these and destroying the automatic centres of the bladder and rectum which lie in the lower sacral segments, we have, as a rule, a retention of urine, which has to be relieved by a catheter, and a total paralysis of the bowel, which has to be cleared by mechanical means. If, however, the tumor is in the dorsal region or above the tenth dorsal segment, as a rule the automatic action of the bladder and rectum goes on irrespective of voluntary control; and hence when the bladder is full it empties itself spontaneously and immediately, and the rectum may act in the same manner. The development of bedsores and of trophic disturbances in the skin and joints is not observed in spinal tumors until the very last stage of the disease, when the skin is absolutely anæsthetic. It is observed earlier and more constantly in intra-spinal than in extra-spinal tumors. It will be remembered that trophic disturbances, bedsores, and cystitis are not uncommonly observed early in cases of myelitis, especially of the lumbar region, and hence this may aid in the differentiation of the two conditions.

Inasmuch as the distribution of the anæsthesia is of great importance in determining the situation of the lesion, I reproduce here a diagram (Fig. 7) illustrating the areas of the skin which are related to the various segments of the spinal cord so far as at present determined by series of cases accompanied by autopsy.[1] This diagram illustrates quite clearly the fact that the effect of spinal lesions, so far as anæsthesia in the surface is concerned, differs widely from the effect of nerve lesions, and hence a study of the exact area of the anæsthesia is of importance both in the differential diagnosis between these conditions and in determining the exact level of the spinal cord affected. It is never to be forgotten that the relation between the spinal segments and the vertebræ is a somewhat variable one,[2] and it is to be remembered that after their

FIG. 7.



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[1] AMERICAN JOURNAL OF THE MEDICAL SCIENCES, July, 1892: Local Anæsthesia as a Guide in the Diagnosis of Lesions in the Lower Spinal Cord. Brain, October, 1894: Local Anæsthesia as a Guide in the Diagnosis of Lesions of the Upper Portion of the Spinal Cord. See also Head: Brain, 1893 and 1894. Thorburn: Brain, 1894.

[2] See Reid: Journal of Anatomy and Physiology, 1889, vol. xxiii. p. 341.

entrance into the spinal canal the sensory nerves turn upward for a variable distance before entering the spinal cord. Hence the location of any tumor in the cord is usually at a point from two to three inches higher than the line of anæsthesia, when that line of anæsthesia extends around the body in the dorsal region. This fact was well illustrated in the cases of spinal tumor removed which are here recorded, for in the case where the line of anæsthesia was at the level of the seventh dorsal nerve the tumor was found beneath the fifth dorsal vertebra, and in the cases where the upper lumbar segments of the cord were compressed by the tumors the tumors were found beneath the eleventh dorsal vertebra. In two cases in which the tumor has not been found at the operation it has been because the incision made was at a level below the tumor; hence this point of diagnosis in regard to the location of the tumor as related to the zone of anæsthesia and to the vertebræ is of considerable practical importance when the question of operation is considered.

From the nature of the lesion it is evident that the suspension of function produced by compression is a distinctly localized disease. It is not denied that an acute transverse myelitis, especially of the mid-dorsal region of the cord, occurs without compression, probably from obstruction of the arterial supply due to endarteritis, whether syphilitic or atheromatous, or to thrombosis. The *rôle* played by vascular diseases in the production of myelitis has only recently been appreciated.[1] And it is probable that many of the cases of so-called spontaneous myelitis, either transverse or disseminated, are really cases of softening of the cord due to defective blood-supply. Such cases of myelitis, however, have a much more rapid course than cases of compression-myelitis from tumor, and, as already indicated, are not attended by pain.

It seems, therefore, that when the symptoms of paraplegia as they develop in spinal tumor are contrasted with the symptoms of paraplegia occurring in acute myelitis, that the contrast is so marked that no mistake can be made between these two conditions.

But chronic myelitis or a myelitis of subacute onset and slow progress is a condition occasionally observed. That such a disease occurs of limited extent in one or two segments only of the spinal cord, without disease of the bones or of the meninges, or without the presence of a tumor, must be admitted, though a careful review of the literature has convinced me that in all probability many cases which have been reported and described in the text-books as subacute or chronic transverse myelitis have been cases of tumor by compression. I do not doubt that a chronic myelitis involving the lower half or the upper half of the cord does occur, of unknown origin, possibly infectious, as developing after fevers, possibly embolic, possibly due to diseases of the bloodvessels, possibly due to toxic agents circulating in the blood. But it is manifest that the symptoms occurring in such extensive chronic myelitis should never be confounded with the symptoms of a compression-myelitis due to a tumor.

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[1] Richardson: Medical Chronicle, Manchester, England, December, 1894, and January, 1895. Marie: Mal. de la Moelle Epinière, 1893.

The combination, then, of the symptom pain, of the peculiar character described, and of a progressive paraplegia with the characteristic order in the development of symptoms named, may be taken as absolutely diagnostic of spinal-cord tumors.

Thirdly. A final point in the diagnosis of these conditions is to be gained by a consideration of the most frequent location of tumors in the spinal cord. A vast majority of these tumors have been found in the dorsal region. It is not denied that a tumor may be located at any portion of the spinal cord, but the study of the cases demonstrates that the dorsal region is the most common seat of a new growth, and hence this fact alone is of aid when other symptoms are present in reaching a diagnosis.

It is not necessary to discuss the differentiation of spinal tumors from gliomatosis of the cord producing the characteristic symptoms of syringe-myelitis. The latter condition is extensive and not limited to a single segment of the cord.

TREATMENT. The practical object of this study of spinal tumors is necessarily the consideration of their removal by surgical interference. I have been able to collect records of twenty-two cases of successful localization of tumors of the cord with removal. These cases are as follows, in the order of their occurrence. I do not include in this list any cases in which there has been an external appearance of tumor which has led to an operation, and in which the tumor has been followed into the spinal canal; such cases are not at all uncommon in the experience of every surgeon, and while they afford some points of interest, inasmuch as phenomena of pain and progressive paraplegia have been present in the majority of them, they can hardly be considered of great interest to the neurologist. But excluding these cases, there is now to be found in the literature a sufficient number of cases of spinal tumor, either extra-dural or intra-dural, with history of operation and removal, to warrant certain conclusions.

I. Horsley and Gowers, *Med.-Chir. Trans.*, 1888, p. 407. A fibromyxoma, intra-dural, removed from the fourth and fifth dorsal segments of the cord. Result: recovery from operation and from condition of paraplegia.

II. MacEwen, *Lancet*, August 11, 1888. Connective-tissue mass under the spines of the fifth to the seventh dorsal vertebræ; extra-dural; removed. Result: recovery from operation and from paraplegia.

III. MacEwen, extra-dural connective-tissue tumor, dorsal region; removed. Result: recovery from operation and paraplegia.

IV.–VI. MacEwen reports without details that he has operated upon three other cases of the same nature, in one of which the operation was successful, in the other two the patients died.

VII. Abbe, *New York Med. Rec.*, February 9, 1889. Tumor, extradural, eighth to tenth dorsal vertebræ; removed. Result: recovery from operation and improvement in paralysis.

VIII. Sonnenburg, *Verhand. d. Deutsch. Gesell. für Chir.*, Eighteenth Congress, Berlin, April, 1889. Sarcoma lower dorsal region. Removal impossible in its entirety. Result: death in six weeks.

IX. Abbe, *New York Med. Rec.*, 1890, p. 85. Sarcoma extra-dural, eighth and ninth dorsal segments; removed. Result: death on ninth day.

X. Horsley, Ninth International Congress of Berlin, 1890. Sub-dural tumor; situation not stated. Result: death from shock.

XI. Roy, *New York Med. Rec.*, 1890, vol. ii. p. 564. Intra-dural tumor removed from eighth to tenth dorsal segments. Result: recovery from operation and from the paraplegia.

XII. Laquer, *Neurol. Centralbl.*, 1891, p. 193. Extra-dural lymph angioma pressing on the cauda equina. Result: recovery from operation and from all symptoms.

XIII. Ransom and Anderson, *British Med. Journ.*, 1892, vol. ii. p. 1144. Hydatid cyst compressing cord at eighth dorsal segment; operation failed to reveal it, being too low down. Result: death three days later.

XIV. Fenger, AMERICAN JOURNAL OF THE MEDICAL SCIENCES, 1892, p. 395. Sarcoma, intra-spinal at sixth and seventh dorsal segments; removal. Result: death on the fifth day.

XV. Caponotto and Pescarolo, *La Reforma Med.*, 1892, p. 543. Myxosarcoma, intra-dural at fourth and fifth dorsal segments; removed. Result: recovery from operation; five months after operation no improvement.

XVI. Ransom and Thompson, *Brit. Med. Journ.*, February 24, 1894. Sarcoma extra-dural, compressing eighth dorsal segment; removed. Result: death on the sixth day.

XVII. Bruns, *Neur. Centralbl.*, 1894, p. 281. Sarcoma intra-dural compressing cord from the eleventh dorsal to the sacral region. Operation failed to reveal existence of the tumor. Result: patient lived fourteen months after the operation.

XVIII. Bruns, *Neur. Centralbl.*, 1894, p. 389. Extra-dural sarcoma compressing cord from the second to the sixth dorsal region; removal. Result: sudden death within twenty-four hours.

XIX. Saenger and Krause, *Munich med. Woch.*, May 29, 1894. Sarcoma compressing sixth dorsal segment; removed. Result: death on the fourth day.

XX. Starr and McCosh. Sarcoma extra-dural, seventh dorsal segment; removed. Result: death after three weeks.

XXI. Starr and McCosh. Lipomata in lumbar region; removed. No improvement. Death from tubercular disease four months later.

XXII. Starr and McBurney. Tubercular tumor in the upper lumbar region; removed. Great improvement during six weeks; recurrence; death.

It will be seen from this summary, that thus far the number of recoveries from the condition of paraplegia after removal of spinal tumor has been but six, and in one of these the compression was exerted upon the cauda equina and not upon the spinal cord. It must be said in explanation of these unfavorable results that an operation has not been undertaken until the tumor has been going on for a number of months, and until the secondary destruction of spinal cord tissue was of such a nature that a regeneration of the nerve-elements was practically out of the question. In several of the cases which have been examined post mortem localized softenings of the cord opposite to the tumor were discovered with more or less ascending or descending degeneration. When such degenerations have occurred recovery is certainly out of the question.

One unfavorable feature in the prognosis of operations is the fact of the usual character of tumors in the spinal cord. These are most frequently sarcoma; next in frequency tubercle, and lastly benign tumors. When there is sarcoma of the cord there is usually sarcoma elsewhere, though sarcoma of the cord may be primary. This fact does not, of course, exclude an operation, but it makes the general prognosis unfavorable. It is a question whether tubercular tumors should be operated upon, inasmuch as the tendency is to recur, and inasmuch as there is usually tuberculosis of other organs. It will be noticed that in the cases that have recovered the nature of the tumor has been of a benign type —fibroma, lipoma, and connective-tissue tumors; but inasmuch as the existence of malignant tumors in other parts of the body does not appear to contra-indicate an operation, provided that operation is done sufficiently early, it seems to me that this fact should not stand in the way of operation where the diagnosis is quite clear. The development of the symptoms appears to be more rapid in the case of malignant tumors than in the case of benign tumors, and this fact may be of service in deciding the prognosis before the operation.

Tumors which lie within the spinal cord itself, developing in the gray matter, are certainly incapable of removal. It is therefore only in extraspinal tumors, either intra-dural or extra-dural, that an operation can be done. The differential diagnosis between intra-spinal and extra-spinal tumors is difficult—in some cases impossible; and hence an operation must always be considered as in one sense exploratory. The chief points of diagnosis of an intra-spinal tumor are the development of Brown-Séquard paralysis prior to the development of paraplegia; the early occurrence of marked atrophy and reaction of degeneration in the muscles; the early occurrence of trophic disturbances and of bedsores; and the development of analgesia prior to anæsthesia. In spite, however, of the gravity of the situation and of the very unfavorable results that have thus far attended the removal of spinal tumors, it is always to be remembered that the disease is of a hopeless character and of a necessarily fatal termination, and hence that any measures for its relief are justifiable, even though attended with considerable danger to the patient. It is also to be remembered that the earlier the diagnosis can be made and the sooner the operation can be undertaken, the more likely it is to be followed by relief. Hence, too much importance cannot be ascribed to the necessity of careful examination and the study of the diagnostic symptoms of spinal tumor.

As to the operation itself, I hardly venture to make any observations in a domain which should naturally belong exclusively to the surgeon. After witnessing, however, a number of operations upon the spinal cord of various characters, there are certain facts which have impressed themselves upon my mind which I cannot but mention.

1. The necessity of a large incision of considerable length, in order that the muscles may be easily pulled aside and held by retractors, while the bones are being cut through, because the depth of the wound is so great that plenty of space is required.

2. The liability of very large hemorrhage from the muscular arteries of the back, which is best arrested by packing the wound with gauze and by pressure exerted upon the gauze by means of broad retractors. If time is expended in tying these numerous arteries, the operation is much delayed, and pressure is sufficient to arrest the hemorrhage in the majority of cases, especially when it is kept up for one-half hour, the time usually occupied in completing the operation.

3. It is best to remove the spines of the vertebræ with sharp-cutting forceps, and when a moderately fair surface of bone is thus attained to go through to the canal, either by chiselling or by means of gnawing with a sharp rongeur. The surface is not sufficiently flat to accommodate easily a trephine, and the former method is more rapid.

4. The dura should not be opened until the entire extent which it is proposed to lay bare has been attained, and until the wound is practically clear of blood. In some cases the spinal dura pulsates, and in others it does not. This, I think, depends largely upon the general state of the patient and upon his position on the table. The dura is often covered with fat, which should be scraped off. Usually a tumor can be felt and seen through the dura; but if not felt, no hesitation should be had in opening the dura. When the dura is opened a gush of cerebro-spinal fluid is inevitable, and when this occurs a change in the rapidity of pulse and respiration ensues. It seems to me, therefore, that the incision in the dura should be made very slowly, rather a small puncture at first, so that the removal of this cerebro-spinal fluid shall occur slowly. When the dura is incised the cord with its vessels becomes at once evident, and great care should be exerted not to rupture, cut, or tear any of the vessels of the pia mater, for this hemorrhage is very difficult to arrest, inasmuch as these vessels are too delicate to tie, and compression is impossible. I think it is not unlikely that the death in

some of the cases has been due to intra-spinal hemorrhage of a concealed kind subsequent to the operation. Great care should be exerted in dissecting off a tumor to avoid division of the posterior nerve-roots, unless these pass so completely through the tumor that such division cannot be avoided. Division of these nerve-roots is not of any great importance in the dorsal region, but it is to be remembered that in the cervical or lumbar region and about the cauda equina their division will be attended by permanent anæsthesia.

5. Should the tumor extend around the spinal cord great care should be used in pulling the cord aside in order to get at the anterior surface, for slight compression of the cord is sufficient to produce much destruction of its elements or laceration of the nerve-roots.

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AGE AND SEX IN DISEASES OF THE UPPER RESPIRATORY TRACT.

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THAT diseased action exhibits peculiar phases in the different epochs of life is accepted by all medical writers. We become familiar with the expressions "diseases of infancy and childhood," "of middle life, old age," etc. In like manner we recognize the profound influences exerted by sexual states on the manifestations of disease. My object is to invite attention to these topics as they are restricted to the diseases of the respiratory tract, using this phrase in such manner as to embrace the mucous passages of the chest, throat, mouth, and nose. The study of these diseases by exact methods is of such recent date that my statements, taken as a whole, must be considered to be the result of personal experience.

CHILDHOOD. Occasionally a child is brought to the physician with the report that food cannot be taken satisfactorily. After two or three efforts at swallowing, the lips are withdrawn from the nipple and the child cries, and a moment thereafter makes a second attempt to take nourishment, only again to be interrupted. The inference is drawn that, the mouth being closed in the act of sucking, air cannot pass through the nasal passages; after a moment of such closure the infant is instinctively induced to relinquish the nipple in order to breathe. We recognize here one of two conditions, either an adenoid growth lodged in the nasal passage and obstructing the passage of air from the nose to the throat, or a congenital closure (atresia) of the passages themselves. I once operated on a child six weeks old for the condition first named, removing a large adenoid growth, with the result of restoring nasal respiration.

A habit, that in children is uniformly exhibited, of carrying all sorts of foreign bodies in the mouth, will sometimes lead to wounds of the mouth and pharynx. When a child is old enough to creep and walk, the presence of any foreign substance whatever in the mouth is a constant element of danger. Pencils, tin whistles, button-hooks, crochet-needles, the legs of small stools, have all come under my notice as agents which have produced injuries of the kind named. On one occasion a physician brought to me a child, five months old, who, while creeping with a button-hook in its mouth, fell forward, the free end of the hook penetrating the velum, making a long irregular wound. A case is on record of a child holding a crochet-needle in its mouth, falling forward, driving the free end of the needle upward and backward through the velum, thence across the naso-pharynx through the basilar process of the occipital bone and penetrating the brain. Fortunately, so grave a lesion is rare. In the mouth of a gentleman who recently reported for nasal disease I detected a large white, stellated scar on the velum. Upon inquiry I learned the history of an injury. When a child he had fallen forward upon the leg of a toy stool, which he was holding at the time in the mouth. The long, irregular piece of wood penetrated the velum as above stated. From the size of the scar the wound must have been of large size. An important factor in diagnosis is here presented, for a stellated scar is common in the history of old syphilitic anginæ.

A young child is apt to swallow foreign bodies, such as coins, parts of toys, etc. Foreign bodies belonging to the class of foods, such as fragments of bone, masses of flesh or gristle, are rarely met with in childhood. These distinctions are made purely on clinical grounds, for the nature of a foreign body in the œsophagus determines the symptomatology, the prognosis, and the treatment.

When persons report with deformation of the external nose, in which the septum is found deflected, it is infrequent that accounts are not given of injuries to the parts early in life. All things remaining the same, a moderate amount of injury is not sufficient to cause deformity; this is often due either to an error in development or from the effects of occlusion from swollen tissues attending catarrhal inflammation.

Childhood is the period in which symptoms due to adenoid body and hypertrophy of the tonsil are so often brought to the attention of the physician. This is now a rather trite subject. One word, however, in passing. It has been stated that physicians should be cautious in removing enlarged tonsils in boys, for the reason that it might interfere with sexual development. While this tenet is not accepted, yet in a number of instances in my practice, when parents have agreed to an operation for the removal of an adenoid mass, they have suggested that while the child was under the influence of the anæsthetic that the operation of circumcision be also performed. The number of times in which the association of adenoid mass with a grade of phimosis sufficient to demand operation is so great as lead me to believe that some connection exists between the two conditions. It is a subject, however, which demands extended observation before anything like a correct judgment can be obtained.

In a remarkable case of an offensive ozænic odor from the nostrils occurring in an infant, the cause was found to be due to crust-like exudates lodged high up in the nasal chambers between the perpendicular plate and the lateral masses of the ethmoid bone. After these masses were removed the odor disappeared, and has never returned.

YOUTH. One of the most interesting conditions in youth (peculiar, so far as I know, to males) is the effect of prolonged strain on the muscles and bones of the incompletely developed limbs. Let a youth attempt the physical work of a man. Such an individual is apt to have an irritable heart and be subject to flushing of the skin surface. The hands are large, blue, and cold to the touch. The chest is small and contracted. A typical example of a subject as I have described is that of a recruit in the army who is doing a man's work in the drill and on the march. The condition is also seen in members of college athletic teams, bicyclists, etc. Persons of the group last named will not infrequently report with anginose hypertrophies of the nasal mucous membranes and post-nasal catarrh often associated with recurrent idiopathic epistaxis. The bleeding point is ordinarily found at the junction of the triangular cartilage with the vomer. It is absolutely necessary to enjoin the principles of rest to such subjects. In many instances this phase of physical breakdown results in impairment of the general vitalities from which it takes years to recover.

It is probably true that in some way connected with the statements named is another phase of inflammation of the nose and throat which I have never seen in other than young men. As a rule, these youths are in every way normal, so far as the general state of health or development is concerned. The congested mucous membrane of the nose and throat is covered with excess of secretion disassociated with fundamental error in the growth of the parts, and without history of traumatism or habit-effect. Such conditions are not rare. Since I have never seen them after the age of twenty-five, I infer that they spontaneously disappear when adult life is well entered upon.

An interesting clinical state is sometimes presented the practitioner in the changes which occur in the transition of the treble voice of youth to that of the adult. So far as I know, the breaking of the voice, as it is commonly called, is confined to boys. That occasionally youths will present themselves because of a prolonged and apparently unending state of "break of the voice" is undoubtedly true. It is sometimes associated with slight stammering or lisping—in a word, it is a defect in speech-function, and not simply a physiological transition. Ordinarily slight catarrhal excitement is present, and if this be abated the symptoms disappear. In rare instances the trouble is fundamental. When this is the case examination reveals asymmetry in the thyroid cartilage and hyoid bone. Ordinarily the thyroid cartilage is too large and unduly prominent, and the hyoid bone is smaller than normal.

Middle Life and Old Age. The basilingual lymphoid bodies and associated veins, no matter how they impress the eye, do not demand, as a rule, clinical interference, except in persons in or after middle life.

The following is a typical example of the condition I mention. A gentleman, seventy years of age, suffered from two attacks of influenza two years before reporting. He complained of violent cough and distress, referred in a vague way to the region of the pharynx and larynx; the voice was husky, and reading aloud impracticable. Enormously enlarged varicose veins were seen at the base of the tongue and on the fold extending from the œsophagus to the sides of the pharynx; the basilingual glands were moderately enlarged. A series of local treatments were conducted with the object in view of destroying the varicosities of the veins and in reducing the size of the glands by the galvano-cautery. The gentleman lived at a distance and reported at irregular intervals, but in about nine months (at which time he had paid twenty-three visits) all the symptoms had disappeared. I do not offer this case as anything unusual, since the subject of irritation arising from these structures at the base of the tongue is now familiar, but to note the fact that the condition while found in the declining years of life, yet treatment, surgical in character, directed to the base of the tongue, was all that was needed apparently to restore the subject to health.

I recall the case of another gentleman, aged sixty-seven years, an eminent judge, who found it almost impossible to attend to his duties in court by reason of excessive flow of mucus from the throat and mouth. In this case the same conditions existed as already mentioned, and a similar treatment instituted with success; but relief was also gained by the extraction of the lower incisor teeth; these had become loosened by a collection of tartar about their necks; and I concluded that some of the outflow was due to excitement of the submaxillary and salivary glands.

The use of the galvano-cautery in the nose in aged subjects is sometimes demanded, and it is well to remember that the probability of inflammation by continuity extending along the lachrymal duct, and causing inflammation of the lachrymal sac, is marked at this period of life.

Asthma, when not due to hay fever, is more common in persons in middle life than in young or old age, and is more apt to be associated with causes of excitement resident within the chest than in younger persons; for asthma, one must remember that while a nasal origin of the paroxysms is always possible, yet this disposition decreases as the patient advances in life. Morrill Wyman, in his treatise on *Autumnal Catarrh*, p. 39, states that the disease is rare in middle life, and commonly disappears after fifty years of age. I assume a nasal origin in most cases of the disease so named.

Gouty conditions of the nose and throat, especially those exhibiting neurotic elements, are much more common in persons of middle life than in young adults.

Menopause would be naturally associated with many important phases of vasomotor reflex which are commonly seen in diseases of the respiratory passages. But on the whole, menopause is not often a factor.

I remember in this connection, however, a married lady, aged forty-five years, who came under notice June 17, 1882. She had had persistent hay-fever-like attacks since September 18, 1881. The conditions were announced with fever, excessive lachrymation, and attacks of sneezing, which the patient attributed to the inhaling of the odor of clove-pinks which were in a garden attached to her residence. The discharge was colorless and copious. She had suffered from girlhood with neurasthenia with spinal tenderness, and had had an attack of otitis media four years before reporting. The external nose was depressed by an apparent depression of the bridge, but without lateral deflection. The membranes were excessively irritable, red, and swollen, the middle turbinals apparently being intensely infiltrated. Attempts were made to reduce the swelling by depletion, followed by applications of glacial acetic acid and a cautious use of the galvano-cautery. After a treatment of a month there was improvement in every respect. The patient was only seen at irregular intervals until the early part of February the following year. I subsequently received word from her that the menopause had announced itself and all her symptoms had disappeared.

Conditions Peculiar to Sex. The relations of the disease of the upper respiratory tract to sex have already been noted. Morrill Wyman (*loc. cit.*, p. 78) states that hay fever is more frequent in males than in females in the ratio of two to one.

Morrell Mackenzie (*Cyclopædia of the Diseases of Children*, vol. ii. p. 507) found that in about thirty-four cases of tumor of the larynx twenty-one were boys and fourteen were girls. Van Bruns observed that out of one hundred and thirteen children, seventy-three were boys and forty were girls, and Causit gives the proportion of males to females in his cases as twenty-eight to fourteen.

In this connection I will call attention to morbid states of the nose and throat which are confined, so far as I know, to the female. Many of these are familiar conditions, and some were noted long before laryngology was cultivated as a special branch of medicine. Among these may be named aphonia due to functional disturbances, and pharyngitis dependent on uterine and ovarian reflexes.

That catarrhal excitement and other diseases of the pelvic organs can be maintained by primal sources of disease in the throat and nose is, I believe, not appreciated. When a patient reports distresses referable to the pelvic organs as well as to the throat and nose, it becomes a nice question to decide which of the group of symptoms should first receive attention, since (all things remaining the same) it would be imprudent to have the patient treated by two physicians at the same time. The gynecologist is of the opinion that the symptoms that come under his special notice should be first corrected before the nasal and pharyngeal conditions are treated; on the other hand, I am convinced that not infrequently when the catarrhal states of the respiratory tracts are corrected the pelvic symptoms will disappear. It is reasonable to assume that reflexes within the region of visceral activities might be established in one part as readily as in another. I have seen several cases where it was clearly demonstrated that the morbid impression on the health had its initiative in the nasal chambers and throat.

Incipient Basedow's Disease. A clinical condition which I have not seen defined, and which I denominate in my own notes "incipient Basedow's disease," is of common occurrence. The symptoms are multiple and difficult to generalize. I can best illustrate the subject by presenting the following studies of cases:

A lady, aged twenty-six years, unmarried, always of delicate health, reported in September, 1890. The patient was an overworked kindergarten teacher. Eight months before the date of reporting she received a slight shock of electricity by a stroke of lightning. The current passing down a galvanized iron spout, passed through an iron bucket (which the patient was holding in her hand at the time) into her arm. Very little was thought of this condition by the patient and her friends, and no statement was volunteered in connection with it. The patient reported with complaint of cough which had lasted about a month, persistent headache and dropping of mucus from the upper to the lower throat passage. An hypertrophy of the posterior part of the left middle turbinated bone was detected. The physical signs within the chest were normal. The patient flushed painfully from slight causes ever since the date of the shock, and was subject to frequent sneezing attacks. There had been several slight hemorrhages from the throat, which the patient feared might have come from the lungs. The thyroid body was distinctly large, soft in consistence, but not a source of anxiety to the patient. The carotid arteries pulsated violently, and constituted the condition described by Graves as "throbbing carotids." The pulse, the patient sitting quietly, would run from 80 to 100 per minute. Thinking that perhaps a study of the eye might throw some light on the case, I requested the patient to obtain the opinion of Dr. W. F. Norris, who kindly reported as follows: "There is no pulse either arterial or venous in the eyes. The vessels are prominent, and there is a white line along both veins and arteries as they escape from the disk, probably due to thickening of the walls or of their lymph-sheaths. I agree that the throbbing of the carotids is out of proportion to the cardiac and radial pulses." The patient improved markedly under the administration of valerianates of iron and zinc.

A married woman, aged fifty-two years, has been out of health for fifteen years; her brother died of the condition described as laryngeal phthisis, though a sequence of typhoid fever. In other respects the family history was good. Seven years ago the patient was injured in a runaway accident; the carriage in which she was sitting was thrown over; the patient fell, hitting the left side of the head and neck. She was certain that there were no throat symptoms prior to this time. Patient complained of constant expectoration. During the last three years she has had summer attacks of hay fever. Examination of the throat and nose revealed nothing which accounted for the symptoms other than slight narrowing of the left nasal passage anteriorly and moderate catarrhal excitement. The complaint of "phlegm" in the throat was persistent and accompanied by a sense of soreness, the hand being used to indicate the locality by grasping the front of the throat. The patient was pale and slightly chlorotic. The eyes were not projecting, though the carotid arteries were conspicuously throbbing. External inspection showed that the thyroid body was larger on the left side than the right; it was larger than normal—almost constituting a goitre; it extended downward so far as to obliterate the episternal notch; the left part of the thyroid cartilage was smaller than the right. After the patient was placed upon tonic treatment mild constant currents of electricity were passed through the neck; detergent washes were ordered for the throat for six months. She reported with accounts of catarrhal symptoms in which the discharges were muco-purulent. The voice was peculiar, giving the impression as though all the sounds were formed under strain. In February, 1892, she was attacked with the prevalent influenza, after which all symptoms were aggravated. She bitterly complained of a burning sensation referred to the laryngopharynx, and of a feeling as though something was lodged in the throat. The patient described several attacks of functional aphonia. She began gradually to improve, and by March 24th was distinctly better; she passed the summer of 1893 without hay-fever attacks.

In this complicated clinical condition which wavers between chlorosis and hysteria we have a distinct history of shock and undue throbbing of the carotid arteries associated with enlarged thyroid body.

A married lady, aged twenty-nine years, of nervous, apprehensive disposition, had an attack of rheumatic facial paralysis on the right side, at her twelfth year, and has had since that time twitching of the muscles of the face. From the time of puberty she noticed that the thyroid gland was larger than usual, and in warm weather has always been compelled to wear clothing loose around the neck. Two years before the date of reporting the patient developed a nasal catarrh accompanied with dropping of tenacious mucus into the pharynx. Distention of the right lachrymal sac was developed at this time, and the hearing of the right ear became impaired. She could not breathe unless lying on the left side; she suffered greatly from oppression due to insufficient nasal respiration. All these symptoms became worse after the accidental death of her husband by drowning. Examination showed the nasal mucous surfaces diffusely swollen and the nasal septum deflected to the left so as to occlude the nasal chamber on that side. A conspicuous submucous œdema was seen in the oropharynx. An operation was performed March 8, 1894, with the object in view of opening the left nasal chamber. The septum was separated from the floor and pushed over to the right side. (At this date, September 26, 1894, the patient breathes freely through the nose, all symptoms of oppression having disappeared; the deafness is entirely gone, though the dropping from the nose into the pharynx continues, and the thyroid gland is unchanged in shape and size and the nervous twitchings continue.) After the operation the swelling of the lachrymal sac disappeared and has not returned. It is also interesting to note that the patient reports herself greatly improved and satisfied with all which has been done, giving her increased breathing capacity through the left nasal chamber, with the cure of the lachrymal swelling, notwithstanding the fact that the catarrhal element in her case remains essentially unchanged.

In this case we have, undoubtedly, a condition antedating the course of the nasal disease, pointing toward the enlargement of the thyroid body, in an apprehensive person of nervous temperament. Upon the development of a naso-pharyngeal catarrh of the usual type, accompanied with insufficient diameter of the left nasal chamber, ensues a profound shock occasioned by grief, after which all the symptoms are exaggerated.

Both the sublingual and basilingual veins are enlarged in middle life and old age. It is common to find small circular node-like swellings on the basilingual veins which are excessively sensitive, and remind one in this respect of the urethral caruncle of females. If these node-like swellings are destroyed, pharyngeal excitement and cough not infrequently shortly disappear. No practical outcome is noted in a clinical study of the conspicuous superficial sublingual veins, other than the fact that it is a convenient way of ascertaining in general terms the age of patients when it is not convenient or expedient to ask leading questions.

I have never seen but three examples of sclerosis of the tonsil, and all these were in married women.

Morphological Factors. There are a few points in the morphology of the bones of the face in females which may assume practical importance. One of these is the asymmetry of the middle turbinated bones. I am of the impression (not being able to state the results of examination of a sufficient number of individuals to demonstrate the fact) that females much more frequently than males exhibit one of the middle turbinated bones (ordinarily the right) of enormous proportions. In my studies of crania I am enabled not infrequently to come to a decision as to the sex to which a given specimen belongs by this peculiarity. A nasal catarrh engrafted upon the nasal chamber showing such inflations is not apt to yield promptly to treatment. Marked asymmetry of the middle turbinals, all things remaining the same, should induce the physician to be cautious in giving a favorable prognosis for the treatment of chronic nasal catarrh. The frontal sinus in the female is apt to be smaller than the male and to be associated with a rudimental glabella. I have notes of three cases of empyema of the frontal sinus in females which were associated with empyema of the maxillary sinus on the same side. In all of these cases it could be easily demonstrated that the pus-bearing surfaces were continuous. Nothing similar to this has been noted in the male.

Four cases of atrophic rhinitis of high grade in young children have come under my notice. All of these were fundamental and associated with defective rates of development of the skull. Three of these cases were in girls.

Hyperostosis of the line of the intermaxillary suture (*torus palatinus*) is a common condition in females, but a rare one in males. No practical outcome exists for this state of affairs, but the fact is in harmony with what I have stated as to the morphological features being more commonly seen in one sex than the other. Chassaignac (*Bull. de la Soc. de Chirurg. de Paris,* I. Series, vol. ii., 1851–52, p. 128) reports two cases of constitutional syphilis in which a structure named by him medio-palatine exostosis was present. I cannot fail to note that both of the individuals were females, and think it probable that they exhibited the ordinary *torus palatinus* which is, so far as I know, independent of syphilis or of any other constitutional disease.

ON NYSTAGMUS—CONSIDERED IN ITS CLINICAL ASPECTS.

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Nystagmus, which may be defined as an involuntary movement of the eyes, is oftentimes a sign of great importance in connection with diseases of the eyes and of the nervous system. Nystagmus is a symptom rather than a disease, except when occurring as the condition known as miner's nystagmus, and it is as a *symptom* that I treat of it at present.

Let us first note the direction of the movement; this may be (*a*) lateral; (*b*) vertical; (*c*) rotatory, the eyes moving to and fro on an antero-posterior axis like the fly-wheel of a watch; (*d*) mixed—a compound of lateral and rotatory, or of vertical and rotatory; or, lastly, (*e*) a peculiar variety present only in blind eyes. In this form the eyes are moved with one sweep over to one side and return in a series of short jerks, only to be swept back again, and return as before.

My own impression is that the swift sweeping movements are more usually toward the left side than toward the right, and the slow jerky return is toward the right, but I am not prepared to assert that it is always so. It is possible that this may be associated with our reading methods—the eye-muscles have learned the habit of a long swift flight to the left of the page, and of slower and more jerky movements to the right along the line of print. We can only expect this rule to hold good for patients who have possessed at one time reading vision.

The area and the rapidity of movement vary from the extensive sweeps just mentioned, which may be so slow as seven to ten times a minute, up to a movement so minute in excursion as only to be visible when the ophthalmoscope is used and the disk seen to twitter very slightly, with a rapidity of two hundred times or even more per minute. In miner's nystagmus, or in that of childhood, the movement is readily visible on inspection at the rate of sixty to one hundred per minute. Now as to what it is, what the factors are which determine whether the nystagmus shall be vertical, rotatory, or what, we are absolutely ignorant, except, perhaps, in the case of miner's nystagmus. We know no reason why in one infant the nystagmus is lateral, while in another the excursion is a compound of vertical and rotatory movements. But this we know, that whatever the direction, the movements always affect both eyes, and are always conjugate. To the first of these statements there are very rare exceptions, so rare as merely to give emphasis to the rule; the second means that both eyes are moved in the same direction at the same movement and to the same extent; thus they may be both moved upward, then both downward; or both may be moved to the right hand, then both to the left; but they never converge and diverge, one eye never moves down while the other moves up, the vertical meridians are never inclined toward one another, and then away from one another, and so on. This fact, which does not at first sight, perhaps, seem very important, has this value, that it points very clearly to a central and nervous cause rather than to a peripheral muscular cause.

When we now turn to the etiology of nystagmus we find that we may distinguish five groups having distinctive causes, three of which are important, the other two will not delay us long. They are: 1. Congenital nystagmus. 2. That of acquired defective vision. 3. That of miners. 4. That of exhausted muscle. 5. That of nervous disease. 1. Nystagmus of infancy arises thus: In the normal infant, after a very few months, the macula lutea is the part of the fundus which comes to be directed upon any object at which the child looks—in other words, the infant learns to "fix" any object with the macula, because by so doing he obtains better vision than with any other portion of the retina, for the physical formation of the macula is such that it is the sharpest-sighted spot on the fundus. But if any intra-uterine or very early infantile cause should be present preventing this "superiority of the macula" before the knowledge of it has been acquired, then nystagmus is apt to occur because there is no reason why one portion of the retina is any better than another, and the cerebral centres have never been educated into insisting on fixation of the eyes by harmoniously regulated muscular action. It is carefully to be noted that even if such a cause be present in one eye, then, provided the other be normal, we have no nystagmus unless the good eye is shaded, when it *may* occur. This also is one of the facts pointing to a cerebral rather than to a local origin. This cause of non-superiority of the macular images may be one of several; the most frequent are: Intra-uterine choroido-retinitis, albinism, congenital cataract, and ophthalmia neonatorum. The last-mentioned acts, by producing dense nebulæ of the corneæ, through which no images can be formed, and even if the nebulæ eventually clear away the nystagmus may remain permanently if the nebulæ have been large, dense, and of long duration. In the cases, then, of nebulæ of the cornea and of congenital cataract the threatened occurrence of nystagmus will be a sign that an operation should be performed at once with the view of giving better images on the retina, and so of producing and establishing the superiority of the macula. In this form of nystagmus the patient never has the impression of the objects looked at moving about, and, although vision is never perfect, it may be very fairly good. If the vision is at all good, the movements are rapid and the excursion small. The direction may be lateral, vertical, or rotatory. In some patients affected with this condition a curious habit is sometimes seen. When such a person is asked to look at an object held straight in front of the face, nystagmus becomes for the time being exaggerated, but when left to himself the patient turns one side of the head forward, say the left, and at the same time turns both eyes over to the left side. I believe the explanation of this act to be twofold: in the first place, the eyes being usually ametropic, he obtains the advantage of cutting off some of the circles of diffusion by means of eyelids and nose—an optical reason; in the second place, the innervative energy of one muscle of each eye being greatly increased in order to turn the eyes far over to one side, that muscle asserts itself over all others and steadies the eyes, greatly reducing, if not actually annihilating the nystagmus temporarily —a muscular cause. By this simple act vision often becomes greatly improved.

2. The second variety, that of acquired defective sight, might have been put under the heading of the first, were it not that in this case the movements are much slower and the excursion more extended. It occurs most frequently and typically in cases of retrobulbar neuritis, in which the central vision is destroyed while some sight is retained peripherally, but may occur along with ordinary atrophy of the nerve and in other conditions.

The occurrence of nystagmus under these circumstances is of very grave significance as regards prognosis. Here, again, the patients are never troubled by any supposed movement of the objects seen; the reason for which is sufficiently obvious.

3. In the case of the third variety, we have to do with an actual disease—miner's nystagmus—not now with a symptom produced by a disease. It is a condition on the subject of which a very great deal has been written, and in the present article, which is intended to be clinical, one must not be led away into discussion of the many interesting problems in connection with it. It is sufficient to say that, according to the best authorities, the condition arises as a result of the severe and prolonged muscular strain under disadvantageous circumstances, generally speaking. The miner requires to adopt a constrained attitude of the body, and to fix the eyes on the "face" of the coal at which he is working. Often the spot at which he has to look is above the level of the eyes as he crouches at his work, or it may be over at one side. If we try for ourselves, we soon discover how fatiguing and painful it is to cause the eyes to converge upon a point held above their level and near the face. Convergence and looking down go together, and the situation of the nuclei for these movements agrees with that arrangement; convergence with looking up, or with exaggerated conjugate lateral movement, is painful and fatiguing. Now, this is exactly what the miner so often has to do, and as a result of neuro-muscular fatigue involved we have the development of nystagmus. And, in addition, it must be remembered that often the miner has to work in very feeble and insufficient

illumination—a circumstance which, no doubt, assists to bring on nystagmus by increasing the difficulty of fixation. Some surgeons indeed go so far as to assert that the deficiency of light is an element in the production of nystagmus more potent than the neuro-muscular fatigue. With this opinion, however, I do not see my way to agree.

Often at the time the patient first comes to us he has no nystagmus on looking straight forward or on looking downward, but ask him to look at your finger near his face and raise it above the level of his eyes, and at once nystagmus begins; or ask him to adopt his working attitude, and the same happens. The movements are generally rapid and vertical, or a mixture of vertical and rotatory. The patients complain of a very uneasy, even painful, cramped sensation in the eyes while the nystagmus is present, and are distressed by the sensation that objects "dance" before the eyes. Fortunately in ordinary cases prognosis is good, provided the patient can change his work to a daylight occupation and provided he keeps his health. In this disease one not infrequently observes very prettily the good and bad effects of alcohol. If the subject of it takes a small "dose" of that drug, nystagmus disappears, because the system is temporarily braced up and able to make the required effort; but if the patient repeats the "dram" too frequently, tone suffers and the symptom reappears in an exaggerated form. Miners themselves know this well, I find.

4. The nystagmus of exhausted muscle is observed in cases in which an exterior ocular muscle has become paretic—enfeebled, but not completely paralyzed—or in which a muscle is recovering from a paralytic affection. When strain is put on a muscle in such condition, as when a patient with a weak left external rectus is caused to look as far to his left side as possible, the left eye will be observed to execute little jerky movements. A precisely analogous condition may be seen in other parts of the body. For example, when one holds his arm out from the side and keeps it so, as long as possible, the muscles after a time become fatigued, and the hand is observed to be dropped a little way and jerked up again. This occurs repeatedly until at last the whole muscular contraction gives way, and the arm falls down to the side. This is simply "nystagmus" of the arm. In the eye nystagmus is produced in exactly the same fashion; the weak muscle unequal to the maintenance of the effort required contracts in a spasmodic, not in a uniformly tonic manner.

5. The nystagmus with which one meets in cases of nervous disease we must leave to be treated of by the physicians, but its main features must be mentioned here, that we may complete our review of the subject. It is most typically present in disseminated sclerosis, though met with frequently also in some conditions of the cerebellum. One peculiar feature of this form is that often the jerky movements, which are of

rather extensive excursion, become more marked on an effort being made to fix the eyes on an object not at the moment in the line of vision, just as the jerky movements of the hand become exaggerated on an attempt to perform any given act. In this condition, also, provided the vision be good, the patients complain of the apparent movement of surrounding objects. Optic atrophy is common enough in cases of disseminated sclerosis, and if vision has thus been lost, this distressing movement of objects is, of course, not felt.

In respect of the treatment and prognosis of nystagmus there is not much to say, because the matter simply resolves itself into treatment of the cause; nystagmus cannot be directly treated. In the nystagmus ot infantile origin, provided there be some vision, prognosis is good, the nystagmus in very many cases becoming much less as age goes on, and indeed in a few ceasing altogether. Correction by suitable lenses of any refractive defect is often of decided benefit. If vision improves, so does the nystagmus, but the movement may remain even when the cause is removed. Thus in cases in which nystagmus is the result of early ulceration of the corneæ, with subsequent opacities, we may often see the symptom persisting long after the corneæ have become perfectly transparent. In a case of dense central leucoma of both corneæ, but with a considerable area of clear cornea outside the white spot, or in a case of congenital cataract, if nystagmus threaten, we should rather hasten to operate, so as to improve vision and avert nystagmus. In the case of miner's nystagmus the treatment consists in removing the patient from pit-work, and in improving the health. Unless the case has been a long-continued and a severe one the prognosis is decidedly good.

INVERSION OF THE VERMIFORM APPENDIX.[1]

By George M. Edebohls, A.M., M.D.,
PROFESSOR OF DISEASES OF WOMEN AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL; GYNECOLOGIST TO ST. FRANCIS' HOSPITAL; CONSULTING GYNECOLOGIST TO ST. JOHN'S HOSPITAL.

The two methods at present in vogue of dealing with the stump in the operation for appendicitis are far from being surgically ideal and perfect.

In the first of these methods the appendix is simply ligated at or near its base and cut away on the distal side of the ligature. Whether all the coats of the appendix, or the muscular and mucous, or the mucous alone, be included in the ligature, the resulting stump contains mucous membrane until recently within the lumen of the intestinal canal, now suddenly transplanted into the peritoneal cavity. In no other operation of which the writer has knowledge is this condition intentionally brought about. To minimize the obvious danger of infective peritonitis, the stump of the appendix is treated in a variety of ways with a view to its disinfection, such as the actual cautery, the application of caustics and strong antiseptic solutions, etc. In whatsoever manner treated, however, the stump remains as an excrescence upon the peritoneal surface of the caput coli, with the chances of adhesions to neighboring coils of intestine as well as the other undesirable possibilities pertaining to all stumps left within the peritoneal cavity. A case where septic peritonitis and death followed slipping of the ligature applied in this way is known to the writer.

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[1] Read before the Medical Society of the State of New York, February 5, 1895.

FIG. 1.

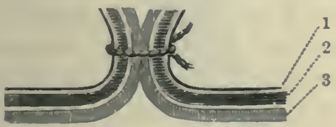

FIG. 2.

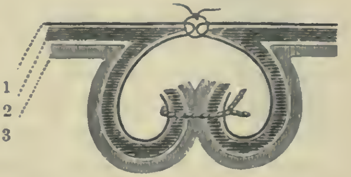

FIG. 1.—Simple ligation of appendix; stump free in peritoneal cavity. 1, peritoneum; 2, muscularis; 3, mucosa.

FIG. 2.—Ligation of appendix with depression of stump; stump bottled in a recess of peritoneal cavity. 1, peritoneum; 2, muscularis; 3, mucosa.

The second method attempts to overcome the disadvantages of leaving a pedicle free in the peritoneal cavity by depressing the ligated stump of the appendix and covering it over by appropriate sutures of the contiguous peritoneum. This second method, although superior to the first, has also its evident drawbacks. That part of the depressed stump on the distal side of the ligature, which is simply bottled up in an artificial recess of the peritoneal cavity, is liable to necrosis, with secondary infection of the peritoneal sutures covering it in, and possible further extension of the infection. The danger remains the same when the peritoneum has been stripped back before ligating and sinking the stump.

To get rid of the drawbacks and dangers attending ligation of the appendix with its resultant stump, the writer has devised and practised inversion of the appendix. The idea and practice are, as far as he knows, original with him. In view of the apparent simplicity of the conception, however, he should not be greatly surprised to learn that he had but furnished an additional illustration of the truth of the adage, "nothing new under the sun."

The term, inversion of the appendix, sufficiently explains itself. It consists in inverting into the lumen of the large intestine either the entire appendix or any part thereof remaining attached to the caput coli, so that the appendix, or what remains of it, instead of being free in the peritoneal cavity is now free within the lumen of the bowel. The mucous lining of the appendix thus inverted becomes the external coat, and its former serous covering lines the new lumen, along the whole extent of which it lies in contact with itself. The mouth of the inverted appendix, on the peritoneal aspect of the caput coli, is closed by suture to prevent reinversion of the inverted appendix.

FIG. 3.

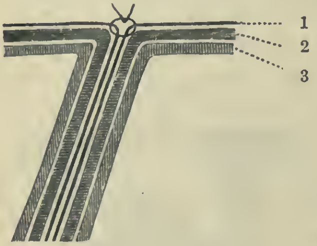

FIG. 4.

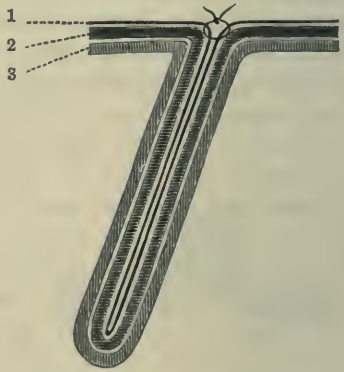

FIG. 3.—Inversion of stump of appendix, *without ligation;* peritoneal mouth closed by suture. 1, peritoneum; 2, muscularis; 3, mucosa.

FIG. 4.—Inversion of entire appendix; peritoneal mouth closed by suture. 1, peritoneum; 2, muscularis; 3, mucosa.

Inversion of the appendix not only excludes ligation of the appendix, but becomes the rival of the latter in every case in which the ligature can be legitimately applied. It merely becomes a question, in a given case, whether the whole appendix or only the stump left after amputation of a greater or less part of its distal portion shall be inverted.

In some cases of acute gangrenous appendicitis, where the gangrene affects the very root of the appendix, and often even contiguous portions of the walls of the caput coli, neither ligation nor inversion of the appendix are applicable. Whenever the disease, however, has spared the vitality of a greater or less portion of the appendix next to the caput coli, and this occurs in the great majority of cases of acute appendicitis, then inversion of the stump without ligation is practicable, with one possible exception only. That is in cases in which it may be difficult to sew the mouth of the inverted appendix *in situ*, and in which it is at the same time unwise to disturb the relations of the parts so as to render the origin of the appendix more accessible. Under such conditions simple ligation may be preferable.

In chronic appendicitis inversion of either the whole appendix or of the stump of the appendix is practicable in all cases in which ligation, with or without depression of the stump, has heretofore been employed. If the whole appendix be pretty uniformly thickened, the entire organ should be inverted without opening its lumen at any point. If unequal thickening or stricture of the appendix with distention of the distal end should prove a mechanical obstacle to inversion of the entire appendix, then the stump left after amputation of the distal end should be inverted *without ligation.* The fecal fistulæ following operations for chronic appendicitis, in which ligation of the appendix had been practised, might have been averted by inversion of the appendix.

Inversion of the normal appendix is so simple and easy a matter, and withal in itself so devoid of danger, that the writer is prepared to go a step farther and to advocate inversion of the normal appendix whenever, for any reason, the abdomen is opened, provided the site or length of the abdominal incision renders the appendix easily accessible. There are those among our surgeons who, under the conditions just stated, advocate ligation and removal of the normal appendix. How much more does their logic apply to the inversion of the entire appendix as contrasted with ligation and ablation. Inversion of the normal appendix requires less than five minutes for its performance, and is absolutely free from risk, the appendix not being opened, and no choked-off stump containing dangerous mucous membrane being left in contact with the peritoneum.

The technique of inversion of the appendix, although apparently a simple matter, may profitably occupy our attention for a moment. The writer first attempted inversion of the appendix a year ago, and succeeded at the first trial in inverting, without previous ligation, the proximal half of the appendix after amputation of the distal half. This was in a case of chronic appendicitis. In his next two cases of chronic appendicitis he attempted to invert the entire appendix, and failed. Recourse was had to the cadaver and the following technique elaborated. By means of it the writer has succeeded in easily inverting, without ligation, two stumps left after amputation of the distal part of the appendix; once in a case of acute and once in a case of chronic appendicitis. In the latter, amputation was called for because the distal half of the inflamed appendix was too thick to pass through the lumen of the inverted proximal half. Inversion of the entire appendix he has performed six times. One normal appendix was inverted entire on the occasion of a cœliotomy undertaken for the total extirpation of a fibromatous uterus. The remaining five were cases of chronic appendicitis associated with movable right kidney, the frequency of which association the writer believes he was the first to call attention to ("Notes on Movable Kidney and Nephrorrhaphy," *Amer. Journ. Obst.*, February, 1895).

Inversion of the entire appendix is practised as follows: After freeing and lifting the appendix, the mesoappendix is tied with catgut close to the base of the appendix. The mesoappendix is then separated from the appendix in the line of connection of the two, it being undesirable to invert any fat with the appendix. The excess of mesoappendix beyond the ligature is cut away and the appendix cleanly freed from all surrounding tissues down to its origin from the cæcum. A strand of fine silk or chromicized catgut is next passed through the peritoneal investment of the caput coli, either above or below, and as close as possible to the point of origin of the appendix. This strand is used to close the peritoneal mouth after inversion of the appendix by a running Lembert suture. Or the strand of fine silk or catgut may be passed subperitoneally around the base of the appendix and be tightened, after inversion of the appendix, as a purse-string suture. The author has employed both methods and both suture materials, and prefers the Lembert suture of chromicized catgut, No. 0 or 00.

The strand thus inserted becomes the landmark in inversion of the appendix. The assistant gently grasps the caput coli with the index-finger and thumb of either hand just above and below the origin of the appendix. The hole through which the appendix is to be inverted thus comes to lie between the fingers and thumbs of the assistant. The operator seizes the appendix near its base with thumb-forceps and inverts first the proximal part of the appendix. The portion inverted is held in by a finger of the other hand or by a second forceps, while the first forceps grasps anew another portion of the appendix and pushes it in after the first; and so on until the tip of the appendix is pushed inside of the peritoneal mouth. The assistant is now relieved from further duty. The operator grasps the lips of the opening through which the appendix has disappeared with the forefinger and thumb of one hand. With the fingers of the other hand he feels for and grasps the now half-inverted appendix through the coats of the caput coli. Appropriate manipulation of the semi-inverted appendix, consisting chiefly of gentle stripping or milking of the appendix in a direction from its origin toward its free end, will soon convert the semi-inversion into complete inversion. The exact moment of accomplishment of the latter is readily recognized by the fingers. Closure of the peritoneal mouth by a few Lembert stitches completes the little operation, which can be done in less time than is required to describe it. That further experience will lead to improvement in the above technique is probable. Closure of the peritoneal mouth by suture, to prevent reinversion, can *possibly* be dispensed with after inversion of the *entire* appendix.

When the stump of an appendix is to be inverted the portion it is desired to remove is first amputated. The open mouth of the appendix is closed by appropriate clamp-forceps. With the aid of the latter the appendix is then inverted, the forceps withdrawn, and the peritoneal mouth closed by Lembert sutures The suturing should, for evident reasons, be more carefully performed when the open appendix has been inverted, than when the appendix has been invaginated entire and uncut.

The bowels may be moved after inversion of the entire appendix at the pleasure of the individual operator.

What becomes of the inverted appendix? The writer freely confesses to a feeling of indifference as to its fate. Whether it maintains its organization or sloughs and passes off with the feces, the inverted appendix is for its wearer no longer a source of danger. The danger from an appendix lies in the fact that it contains a mucous membrane or a mass of lymphoid tissue, subject to inflammation and practically unlimited swelling, inside a firm, unyielding muscular, fibrous, and peritoneal coat. These conditions are changed as soon as the appendix is turned inside out and the mucous coat becomes the external layer. Theoretically it should slough, in part at least, as its chief blood-supply is cut off when the mesoappendix is ligated.

In conclusion the writer would respectfully submit the following propositions:

1. Inversion of the stump of the appendix should be substituted for ligation in all cases of acute appendicitis in which it can be applied.
2. In chronic appendicitis either the entire appendix or its stump should be inverted, preference being given to inversion of the uncut appendix whenever practicable.
3. In all cœliotomies undertaken for the relief of conditions other than appendicitis, the normal appendix, if readily and safely accessible, should be inverted entire.

NOTE.—In April, 1895, over two months after the above paper was read, and while the manuscript was in the hands of the publisher, Dr. R. H. M. Dawbarn read a paper before the New York Surgical Society on the subject of appendicitis. In this paper he described *inversion of the stump of the appendix*, exactly the procedure advocated above, although Dr. Dawbarn's technique varies somewhat from my own. Correspondence with Dr. Dawbarn has elicited the fact that he first performed inversion of the stump of the appendix in April, 1891. As my own first case bears date of January 30, 1894, priority of *inversion of the stump of the appendix* clearly belongs to Dr. Dawbarn. Neither Dr. Dawbarn nor myself knew of each other's work in this direction until the reading of Dr. Dawbarn's paper and the discussion thereon brought out the foregoing facts.

In his letter to me Dr. Dawbarn writes: "I can see no sense in ligating the stump-end at all, if it is going to be inverted, any more than I should think of tying a string around a wound in a gut before inverting its edges and using Lembert sutures. The analogy is perfect."

As to *inversion of the entire uncut appendix*, Dr. Dawbarn, whose researches into the literature of the subject have been much more extensive than my own, unhesitatingly ascribes to me priority. He himself has never performed inversion of the entire appendix, nor has he found any mention of the matter in medical literature.

A NEW METHOD OF STUDYING CELL-MOTION.[1]

By Charles Lester Leonard, A.M., M.D.

Since the enunciation by Virchow in 1858 of his theory of cellular pathology the attention of the scientific world has been centred about the study of this unit. Nearly all the unsolved problems of medical science involve in one way or another the consideration of some one of the functions of the cell.

It is my purpose in this paper to call your attention to a new method of studying one of these functions. I have chosen as illustrations some of the well-known facts of physiology already seen and described by competent observers, and have confined the greater part of my study to cell-motion as exemplified in the movements of the red and white blood-corpuscles.

The possibilities of these studies was suggested to my mind by the successful result of an experiment in instantaneous photomicrography made in November, 1892.

The method, which it is the purpose of this paper to illustrate, consists in the making of a consecutive series of instantaneous photomicrographs of the same microscopic field taken at definite intervals, and the comparative study of the series.

The results obtained by this method are the elimination to a greater extent of the personal equation of the observer, the procuring of incontestable proof of phenomena observed, the extension of the observations over any length of time, and the possibility of studying the changes occurring over the entire field at any one moment.

Another feature of this method is that it enables the student to study the condition of a fresh, living, unstained specimen for any length of time in fields taken at definite intervals.

The magnifications given are in diameters measured by the projection of the lines of a stage micrometer. The original magnification was to two thousand diameters. This, however, has been reduced in the process of reproduction, and the magnification is at present to one thousand diameters.

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[1] Abstract of paper read before the Academy of the Natural Sciences of Philadelphia, January 15, 1895.

I first ask your attention to the study of some of the different conditions observed in blood upon the warm stage; afterward considering the amœboid motion of the red and white blood-corpuscles and their diapedesis through the vessel-walls.

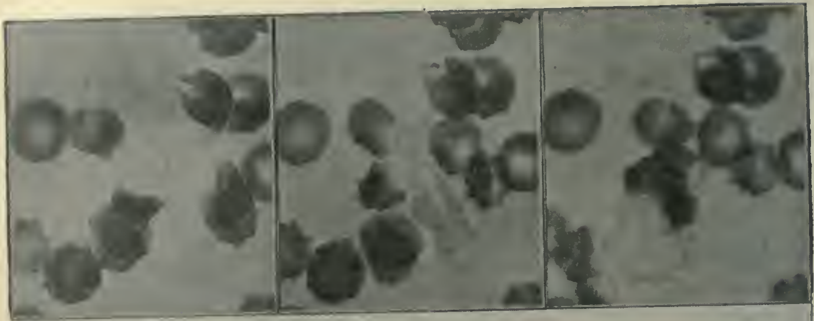
AMŒBOID MOTION OF THE WHITE BLOOD-CORPUSCLE.

Series A.—This series illustrates the amœboid motion of the white corpuscle; the granular nature of the surface of the corpuscle is well marked; its inherent power to overcome obstacles that obstruct its passage and to move them aside is clearly shown in the motion imparted to the surrounding red blood-corpuscles, overcoming, as it does, the cohesion existing between them. Their crescent-like groupings make this easily apparent, one crescent being broken up while another is formed. The various forms of red blood-corpuscle, biconcavo-convex, partially and fully crenated, and those distortions produced by crowding and the cohesion which is being overcome are seen in this field. The original magnification was 2000 diameters, and the interval between the pictures two minutes, the entire change of form occurring in less than six minutes upon a hot stage. The identity of the fields is evident.

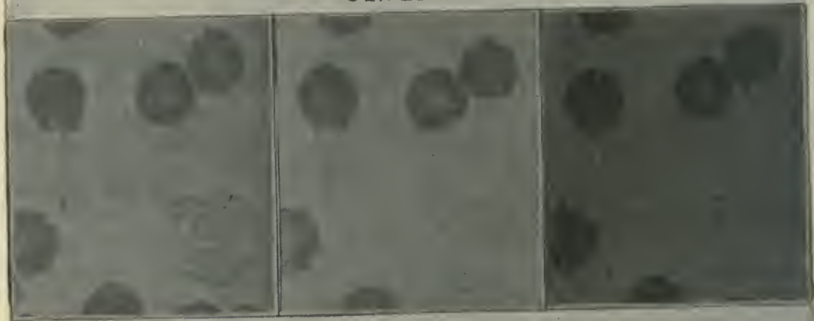
Series B.—This series shows an interesting part played by a white corpuscle which came under the observation of the author and was easily recorded by his method. It will be seen that the white corpuscle has seized upon a red corpuscle, and a comparison of the three photomicrographs will show that the red blood-corpuscle has been dragged downward. The photomicrographs were taken from a series extending over ten minutes.

AMŒBOID MOTION OF THE RED BLOOD-CORPUSCLE.

Series C.—This series shows the motion of a red blood-corpuscle; it extends over half an hour and was seen in the blood of a malarial patient during the study of the intra- and extra-corpuscular pigmented and the free amœboid forms of the malarial plasmodium. The series proves that no other motion took place in the field during the half hour it was under observation. This motion must therefore have been produced by some inherent power in the red blood-corpuscle; and as the photomicrographs show that no twist has occurred, the motion cannot be due to a previous torsion, and may therefore be considered a true amœboid motion of the red blood-corpuscle. We shall also see in the diapedeses of the red blood-corpuscles from a coagulated capillary artery another instance of amœboid motion, and a seeming proof that diapedesis is due to this amœboid motion, and is not a simple filtration due to increased intra-vascular pressure, since we know that the pressure is



SERIES A.



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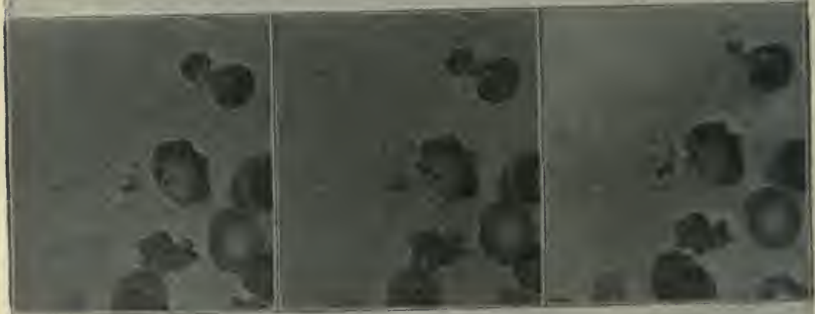

SERIES C.

SERIES D.

decreased by coagulation, or at least that the excess of pressure ceases to act on coagulated blood in a capillary.

DIAPEDESIS OF THE RED BLOOD-CORPUSCLE.

SERIES D.—The diapedesis of the red blood-corpuscle from a stagnated capillary artery is here shown in a number of individual instances. The condition of the blood within the artery is also clearly defined; the red and white corpuscles can be distinctly seen. The wall of the capillary is also easily seen and the parts of corpuscles within and without the capillary can be made out. As mentioned above, the diapedesis from a capillary in this condition would seem to demonstrate the fact that diapedesis is due to amœboid motion of the cells themselves, rather than to the pressure produced by intra-vascular tension and consequent filtration.

Another series taken by the author also illustrates the participation of the amœboid factor in the diapedesis of red blood-corpuscles from capillary arteries; there was an entire absence of corpuscular elements from the capillary, with the exception of a few white corpuscles clinging to its inner surface and in the act of passing through the walls, while red blood-corpuscles were seen in the act of passing through the capillary wall, consequently there was absence of intra-vascular tension, as there was stasis and no blood in or flowing through the vessel.

These pictures are not shown as the perfect results of this method, or as the results of research by it; they are simply to illustrate the author's method of studying cell-motion and to prove it capable and worthy of scientific consideration as a method of study and able to uphold the claims made for it.

Its usefulness in producing accurate illustrations, both for publication and for lantern slides, cannot be over-estimated. The student then sees illustrations whose counterpart he can find and recognize under the microscope.

The method is of universal application, lines of research suggest themselves to all microscopists, and wherever the factor of microscopic motion is present this method will be found of great value.

The object of this paper has not been to illustrate the results of research by this method, and has used illustration simply to show, by well-known facts illustrated by it, its capabilities as a method of study and its value as a new method of studying microscopic or cell motion.

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THE RADICAL TREATMENT OF HERNIA.

By John B. Deaver, M.D.,
of Philadelphia.

The total number of radical operations I have done up to date is one hundred, and include Macewen's, Barker's, McBurney's, Bassini's, Halsted's, and my own modification, which is a combined Barker and Macewen, and was the one I most frequently performed until the introduction of the Bassini and Halsted operations.

The indications for the radical cure of hernia are first hernias which are complete, and in which the external abdominal ring is so large as to make it difficult, if not impossible, to apply a truss that will hold the rupture; second, irreducible hernias, this being a form in which it is difficult to obtain a truss to fit accurately enough to prevent the escape of a new portion of the gut; and third, strangulated hernias, in which the bowel is not gangrenous, or if deeply injected, when it responds to the application of moist heat sufficiently to permit of its being returned.

The Bassini and Halsted methods have given such satisfactory results, with so small a mortality, that I believe that simple reducible hernia should be included among the indications. Granted that a hernia so treated showed a tendency to relapse after either of these operative procedures, the adjustment of a light-fitting truss will eliminate the probabilities of subsequent strangulation. I have recently operated for obstruction of the bowels in a patient who was the subject of a reducible hernia. The obstruction was due to a band formed by the omentum, which had become rolled upon itself, and had become adherent to the sac of the hernia just beyond the internal abdominal ring. The fact that such a state of affairs can arise seems to me to offer itself as an indication in considering the advisability of this operation in simple reducible hernias.

It is hardly necessary to state here that patients the subjects of chronic coughs, and those who have large, flat and flabby belly-walls, especially in advanced age, are unfavorable cases. When the hernia is very old and large the abdominal cavity must necessarily have contracted more or less in accommodating itself to the absence of the viscera which occupy the hernial sac; therefore, it is questionable if, under these circumstances, it would be wise to perform a radical cure at all. In cases of this character the patient should be kept in bed for some days with the hernia reduced and retained before the operation is even attempted.

The contraindications to operations in general are applicable to the radical treatment of hernia, except, of course, in the case of strangulation, where the operation becomes a life-saving measure.

The choice of operation must necessarily depend upon the individual case. The Bassini, with or without the Halsted modification, is applicable in the great majority of uncomplicated hernias, and to all cases of simple reducible hernia. When strangulation has occurred it may be necessary to treat the wound after the method of McBurney. All, however, agree that the mortality is small. Of course, when we say a cure we must modify the statement as to time for a relapse. The chief etiological factors in the production of hernia are weakened abdominal wall and an elongated mesentery, either congenital or acquired, and so, while we can remove and cure a rupture, we cannot altogether remove these anatomical weaknesses, although in a large percentage we can and do add largely to the strength of the abdominal walls.

Too much importance cannot be laid upon the after-treatment of the case, especially during the first six months. While in bed the ordinary dressing of the wound is quite sufficient; after the patient is up and about a light-fitting truss may be worn constantly for a long period of time, but this I do not feel is necessary. Abdominal massage and electricity are of use as strengtheners of the abdominal walls.

We are all so familiar with the modern methods for the radical cure of hernia that I will not attempt to go into a detailed account of their individual merits, but will give the results of my experience in favor of those which I believe have best fulfilled the indications in obtaining a cure.

The strongest objection to the Macewen operation is that the sac is not opened. By this it seems to me we take a great deal for granted in not inspecting the contents to determine the presence of adhesions. These, while they may not enter as a factor in the reduction of the rupture, may at some future time play an important *rôle* in an acute mechanical intestinal obstruction. The same objection can be urged against the Ball and Kocher operation. Another objection to these operations is that there is an attempt made to close the old canal.

The objection to the McBurney operation is that the permanency of the cure is dependent upon the presence of a large amount of scar-tissue. It is a well-established fact that abdominal wounds that heal by primary union are less liable to be followed by hernia than those which heal by granulation.

Bassini's and Halsted's operations are so logical, and based upon such firm anatomical and physiological grounds, and have given such satisfactory results, that they have practically supplanted all other methods of operation.

Between the Bassini and Halsted operation I give preference to the latter for the majority of cases. I agree with Halsted, that it is not always advisable to bring the cord out at the internal abdominal ring, but this should be determined by the condition of the muscles at this locality. By excising the superfluous veins of the cord the latter is reduced in size, and consequently its opening of exit is correspondingly smaller, thus offering greater resistance to the entering wedge of the subsequent hernia.

Another feature of the Halsted operation is the position which the cord holds when the operation is completed. The fact that the cord overlies the aponeurosis of the external oblique makes the new canal more circuitous, and, therefore, less liable to be followed by a relapse than in the Bassini operation, where the cord lies below the aponeurosis. This further simplifies the operation by doing away with a second row of sutures.

In the operation for the radical cure of hernia several points present themselves which are well worth discussion, namely, first, the propriety of enucleating the entire sac of an old and large scrotal hernia. This question must be decided according to the condition of the sac itself, and the answer must depend largely on the surgeon's judgment. If the sac be tightly adherent to the tunica vaginalis and the lower portion of the cord, necessitating a prolonged dissection, particularly if the patient be advanced in years, I think it is better to content ourselves with the removal of that portion of the sac which occupies the inguinal canal.

The presence of the remaining portion of the sac does not interfere with the reparative process following the operation. I have seen gangrene of the testicle follow the determined efforts of the surgeon to free the fundus of such a sac.

Second, when a mass of irreducible omentum is encountered it is best to ligate it and cut it away, including only a small portion in each ligature. Care must be exercised in tying the ligatures when the vessels are atheromatous. Under the latter condition it is better to use heavy ligatures, preferably catgut, as the larger ligatures are less liable to cut through the thin-walled vessels.

A condition I have met with a few times, and to which Dr. William T. Bull has called attention, is that of inflammation of the stump of the omentum with localized peritonitis. One of these cases went on to suppuration and opened spontaneously above Poupart's ligament. While the risk of ligating and cutting away a portion of the omentum is slight, still it is not justifiable to expose our patient to this additional risk, and therefore when reducible it should be returned.

A chronic irreducible omental hernia may undergo a variety of changes, viz., calcareous, cystic, or fibrous degeneration. Where the fatty element of the omentum becomes absorbed and the peritoneal surfaces crowded together, adhesion takes place, and the omentum is thus converted into a fibrous cord. Again the peritoneal surfaces may adhere and the serous fluid accumulating in the cavity thus formed, convert it into a cyst. Where the quantity of fluid contained is small and the hernia has been of long duration, these cysts at times resemble intestine or testicle.

It is not very uncommon to meet with the vermiform appendix within and adherent to the sac. As it does not complicate the operation it should be removed. Although it is true that the spleen, the kidney, the ovary and the Fallopian tube, a Meckel's diverticulum and the epiploic appendages, and even a dermoid cyst, have been found in the sac of an inguinal hernia, I have never met with any of these except an epiploic appendix. Certain loose bodies, generally derived from the epiploic appendices, are also met with. An elongated and thickened epiploic appendix may be mistaken for the vermiform appendix.

In one of the cases of inguinal hernia which I operated upon for radical cure there was a prolapse of the extra-peritoneal portion of the bladder which I had the misfortune to open. In an acquired hernia of the inguinal variety it is not uncommon to meet with an undescended testicle occupying the lower part of the canal. This is a serious complication in the radical cure, as in the vast majority of cases it necessitates the removal of the organ. If the testicle, however, can be drawn down into the scrotum it should be made to occupy its normal position.

The operation for the radical cure in congenital inguinal hernia differs from that of the acquired variety from the fact that the tunica vaginalis most commonly constitutes the sac of the hernia, the contents of which are in contact with the testicle. The method of treating the sac in this variety, consists in dissecting out the tunica vaginalis entire with the testicle, or treating it after the manner of Macewen. The latter procedure is preferable, as it saves the testicle and permits the cord and inguinal canal being treated after the method of either Halsted or Bassini. When the testicle is removed with the tunica vaginalis it simply remains to close the canal. As we are not able to recognize this condition before operation, unless the testicle is diseased or very small, thus offering a potent reason for its removal, or are not able to bring it down into the scrotum, I should hesitate to do so without the patient's consent.

The encysted variety of congenital hernia is very rare, although I have met with it. The procedure to be carried out is to separate the hernial sac from the tunica vaginalis, which is patulous up to the internal ring, to ligate it, and cut it away. The radical cure is completed as in ordinary cases.

The difficulty in retaining a femoral hernia by mechanical appliances makes the radical cure particularly applicable to this variety. The contents of the sac are seldom entirely reduced, thus permitting strong adhesions to form.

There is very little difference in the methods for the radical treatment of femoral hernia. I usually perform a modification of Barker's operation, as follows:

After the sac has been exposed and opened and the contents reduced, the neck is tied off high up in the canal with a long silk ligature. The ends of the ligature are allowed to remain long. One end is threaded in the eye of a long-handled curved needle, which is passed up beneath Poupart's ligament and brought out through the aponeurosis of the external oblique on a line with the upper border of the ligament. The needle is withdrawn and the other end of the ligature threaded and brought out one-quarter of an inch on the other side of the first. These are now drawn tight and tied down upon the aponeurosis, thus anchoring the stump of the sac in the orifice of the internal femoral ring. The operation is completed as described by Barker, namely, " A long-handled needle threaded with silk is passed through the posterior layer of the femoral sheath and pubic portion of the fascia lata at a point about an inch below Poupart's ligament, and a little internal to the femoral vein, which is protected by the little finger; it is then thrust upward nearly as far as the peritoneal ridge, and is then made to emerge across the crural opening, and pass through the lower border of Poupart's ligament. The thread is now withdrawn from the eye of the needle, and the latter is removed and threaded afresh and made to traverse the same structures in a similar manner about a quarter of an inch internal to the first stitch. This is repeated until a sufficient number of threads have been introduced to draw the structures together and completely close the femoral canal. The stitches are tied and the skin wound closed."

The operation for the radical treatment of umbilical hernia consists in making two elliptical incisions carried down to the aponeurosis of the external oblique. The sac is freed from the margin of the hernial opening. The sac is now opened and its contents reduced, enlarging the hernial opening if necessary. The redundant portion of the sac and the overlying skin and subcutaneous tissues included between the elliptical incisions is cut away. The margin of the hernial opening is freshened. The edges of the wound are approximated with two rows of sutures; the deep set of kangaroo-tendon, including the aponeurosis and peritoneum, and the superficial of silkworm-gut, including the skin and subcutaneous tissues.

Among the number of operations I have performed for the radical treatment of hernia my record shows 100 cases divided up as follows:

Acquired inguinal	49
Congenital inguinal	8
Strangulated inguinal	18
Femoral	7
Strangulated femoral	11
Umbilical	2
Strangulated umbilical	3
Ventral	2
	—100

In this number there were eight deaths, two following the radical treatment, and six the operation for the radical treatment where strangulation existed. The deaths occurring in the strangulated cases were five inguinal and one umbilical.

TUMOR OF THE CORPUS CALLOSUM, WITH AUTOPSY.

By Richard P. Francis, M.D.,
SURGEON TO THE MOUNTAINSIDE HOSPITAL, MONTCLAIR, N. J.;

WITH PATHOLOGICAL MEMORANDA,

By M. Allen Starr, M.D., and Ira Van Gieson, M.D.,
OF THE COLLEGE OF PHYSICIANS AND SURGEONS, NEW YORK.

The following history is deemed worthy of record, both because it is one of a tumor of the brain, a subject which now seems to be second only to appendicitis in the interest it is exciting, and more particularly because tumors of this nature occurring in this region are very infrequent.

The patient was a widow, aged forty-five years, whom I was called to see one night in October, 1892, on account of an attack "like fits," that had suddenly come on without apparent cause or warning. On reaching the bedside, about midnight, I found a small, well-nourished woman lying in a semi stupor, restlessly moving her hands and turning her head; occasionally she would turn on her side and pull the clothes over her head. There was no froth nor blood at the mouth; the breathing was loud, but not rapid nor labored; the pulse was a little rapid (90), but of good strength and character. The family had been aroused by the patient's groaning, and, on coming to her, found her in this unconscious state. She had eaten a good supper, and on retiring had felt perfectly well. There was no apparent cause for the attack, unless, possibly, a somewhat constipated condition might have had some influence.

About half an hour or so after my arrival she could be roused sufficiently to open her eyes and say "yes" and "no" drowsily, but when this was done she invariably turned on her side and tried to go to sleep The next morning there was some complaint of headache and a general feeling of exhaustion, while the mind seemed a trifle clouded. Rest in bed for a day or two, with a restricted diet and a good clearing out of the bowels, resulted in apparent complete recovery. There was no mental disturbance after the first twelve hours, and absolutely no sign of paralysis. During the subsequent nine months there were three similar attacks at intervals of from six weeks to two months. The character was always the same, and there were no sequelæ, subjective or objective, except a general lassitude and weakness that lasted for a week or so, after which the health would apparently be as good as ever. During this time tonics and reconstructives were used and the patient was urged to rest herself as much as possible—a thing very difficult for her to do.

The family history was not unexceptional. The patient's mother was always "queer," and died suddenly after a short confinement in an insane asylum. A brother is living, and has always been well, though, as stated by friends, "peculiar."

The patient's previous history was, in the main, good. Married at eighteen, and five years later left a widow with four children, her life for the past twenty-five years had been one of constant care and anxiety. There had been only two serious illnesses: one at the time of her mother's death, when the patient was pregnant with her second child. The shock affected her profoundly, and a strong suicidal tendency developed, but after a few months of rest and recreation complete recovery took place. The other illness was an attack of "remittent fever" some twelve years ago, that left the patient in a peculiar mental condition. Long after she ought to have become interested in things about her and anxious to have her children with her, she was perfectly indifferent to them and seemed cold and stolid. Eventually, however, recovery ensued, and the health, both mental and physical, remained excellent until the time of the first convulsion, already recorded.

In June, 1893, nine months after this first attack, the patient was in very good health and did an extra amount of work in housecleaning and preserving. About July 1st, while away on a visit, she was taken with what was thought to be an attack of indigestion, the most marked symptoms being nausea and vomiting. At the end of a week she returned home, not having been sick enough to need medical attention, but evidently not well. The vomiting persisted for a week or ten days, being particularly noticeable after any exertion. At the same time a condition of general exhaustion supervened, together with marked sluggishness of mental action. There was no vertigo and no tendency to fall in any direction. The patient was kept in bed, given a light diet and simple remedies to quiet the stomach, and kept under close observation. As soon, practically, as all motion was forbidden—that is, when the patient was kept quietly in bed—the nausea and vomiting ceased and did not reappear. (It may be noted in passing that throughout the remainder of the sickness, a period of six months, there was no digestive disturbance of any kind.) Heart and lungs were normal, abdominal examination was negative, and the urine presented no pathological features.

On August 1st the following conditions were noted: The patient lies in bed perfectly indifferent to her surroundings; answers questions slowly, but correctly; does not speak unless spoken to; expresses no desire for food or drink, but willingly takes her nourishment and swallows easily. There is extreme general weakness, as evinced by the pressure of the hand and the inability to sit up. For a day or two there has been slight internal strabismus of the right eye, with some dilatation of the pupil. These are the only signs of paralysis present. The tongue protrudes in the median line. The face is symmetrical, but there is occasional twitching of the left side of the face. All the muscles of the extremities can be used. The urine is passed involuntarily and the bowels are inclined to constipation.

There had been no rise of temperature, nor was there any throughout the sickness. The pulse was at all times rapid, above 100, and occasionally rose to 140; its character, too, varied from very weak and fluttering to fairly strong and regular. Heart tonics, digitalis, strophanthus, nitroglycerin, and similar remedies were faithfully used, but appeared to have little or no influence on the heart's action. So weak did the pulse get on several occasions, particularly in the last three or four months, that it was thought that life could last only a short time. But, stimulated by a little hot broth or something similar, the patient rallied and the struggle for life was renewed.

About the middle of August the patient began to complain of dimness of vision, and early in September appeared to be totally blind. There was now evinced a marked tendency of the head to turn to the right, and soon this position was fixed and so persistently maintained that a small ring had to be placed under the ear to prevent undue pressure. The patient complained of pain in the nucha if any attempt was made to turn the head to the median line. It is, perhaps, worthy of note that up to the time the patient took to bed menstruation had been regular and normal; after that time it ceased entirely.

The treatment was mainly symptomatic. Iodide of potash was given with no apparent result, and irritation at the base of the skull was of equal negative value.

On September 19th Dr. Charles J. Kipp, of Newark, examined the patient's eyes and pronounced her totally blind. He stated that there was present a double optic neuritis, with hemorrhage into the right retina. These ocular lesions, taken in connection with the other conditions present and the history, gave additional weight to the opinion that had already been entertained that a cerebral tumor of some kind was present. Thinking that something might be done by operative interference, on September 21st I asked Dr. M. Allen Starr, of New York, to see the patient. The condition at this time was as follows: Patient emaciated, lying on back, with the head turned to the right; right pupil dilated, with right, internal strabismus; pupil-reflex absent on both sides; no drawing of face. Patient will respond to questions slowly and will move the limbs slowly when asked to. The tongue protrudes in the median line; the knee-jerks are normal. There are no tender spots on the head, no anæsthesia nor hyperæsthesia; no ptosis. There is no complaint of headache. After making an examination, Dr. Starr stated that, in his opinion, there was a tumor of the brain present, but where it was or what it was he could not say. The vomiting, the gradual progressive mental dulness, the optic neuritis, the turning of the head to one side, all pointed to tumor of the brain. But the almost absolute lack of anything more than these conditions, which are common to all cerebral tumors, forbade any accurately localizing diagnosis. Of course any operative procedure was out of the question.

From this time on there occurred little worthy of note. The mind gradually grew more and more clouded until, for some six weeks before death, there was no response to outward stimuli. Food was allowed to lie in the mouth or was swallowed and digested. The heart, lungs, and excretory organs performed their functions, but the mind was absolutely dead. Once or twice it was noticed that the head was turned to the median line; the left pupil became dilated at one time. Notwithstanding the fair amount of nourishment taken the emaciation became extreme.

The patient died January 7, 1894, some six months after taking to bed and about fifteen months after the initial symptoms of the trouble. For some hours before death there was marked venous engorgement over the right side of the head.

"The diagnosis of the existence of an intracranial tumor, as a rule, is not difficult. It can be made with greater certainty than that of almost any other encephalic disease" (Mills and Lloyd, in *Pepper's System*, vol. v. p. 1051). It may be worth while to review briefly the salient features of the clinical picture that led to the diagnosis that a tumor of the anterior part of the brain existed.

One of the first disorders suggested was that the condition might be one of grave hysteria—this, of course, before the examination of the eyes showed the presence of serious organic trouble. The subjective blindness, which might or might not have been real; the lack of headache, one of the most constant symptoms of brain tumor; the very slight degree of paralysis, and the absence of reflex-changes, made it not improbable that we had to deal with simply a functional disturbance. But, on the other hand, the double optic neuritis, with retinal hemorrhage, left no room for doubt that, even if there were some hysterical element in the case, there was some more serious trouble back of it.

Kidney trouble was considered, but was readily ruled out by the utter absence of suggestive symptoms in the urine—which was carefully examined several times.

Meningitis of tubercular origin could with fair positiveness be excluded by the absence of tubercular history in the patient and her family, the complete absence of fever, the duration of the disease, and the fact that as far as could be determined no organ except the brain was involved. There was no history of trauma to develop a meningitis from that cause.

Cerebral abscess was eliminated on account of the absence of trauma or ear disease as an exciting cause; moreover, there was no fever and, as the disease progressed, no evidence of pyæmia.

Hemorrhage and embolism, particularly the former, were, perhaps, not so readily excluded. But the absence of any renal lesion, of hypertrophied heart, of atheromatous bloodvessels, and the age of the patient, pointed against hemorrhage; the absence of cardiac lesion or rheumatic history was against embolism, while the gradual progress of the trouble and the absence of paralysis were against both conditions.

Of course, syphilis was possible, as it is in everyone, but was highly improbable. But, partly on the theory that "*jedermann kann syphilitisch sein*," doses of iodide of potash were administered up to the limit of tolerance with no apparent effect, thus practically ruling out the theory of specific infection.

Grouping together the symptoms in the case we see: First, several general convulsions, not epileptiform, occurring without evident cause; then vomiting, not dependent on any digestive disturbance; then gradually increasing mental slowness and uncertainty, with marked slowness of speech and coincident with this a marked change in temperament, from affection to utter coldness and indifference; following this, strabismus and dilatation of the pupil, and, at the same time, incontinence of urine and constipation; then come rotation of the head, with pain on motion, dimness of vision, increasing to blindness, double optic neuritis, and retinal hemorrhage.

These symptoms are those that are common to all tumors of the brain, more or less, wherever situated (Starr in *Keating*, Mills and Lloyd, *loc. cit.*, Jacobi in *Reference Hand-book*, and others), and were of comparatively little use in determining the exact location of the lesion in the present instance. But, at the same time, certain localities could be ruled out on account of the lack of symptoms.

The absence of paralysis or paresis excluded any disturbance of the motor area, while the absence of headache, of vertigo, or of tendency to fall in any one direction, were evidence against tumor of the cerebellum. That the tumor was deep-seated, not involving the cortical area, was made still more probable by the absence of localized pain (Mills and Lloyd, *loc. cit.*, p. 1034).

By exclusion, then, the tumor was thought to be located in or near the frontal lobes and not near the surface. Confirmatory evidence was found in the small amount of vomiting (Mills and Lloyd, *loc. cit.*, p. 1034), with the mental slowness and uncertainty and the change of character (Mills and Lloyd, p. 1037; Starr and McBurney, AMERICAN JOURNAL OF THE MEDICAL SCIENCES, April, 1893).

The autopsy was made by the writer eighteen hours after death. The body was that of a small, well-developed woman, much emaciated; rigor mortis was present; only the head was examined.

On reflecting the scalp there were noticed on the surface of the skull, in the median line, three areas from the size of a dime to a quarter dollar, containing dilated and congested bloodvessels; one of these areas was at the bregma, one about an inch anterior to it, and the largest one about three inches back of it. The calvarium was thin, and was removed without difficulty; on the under surface, corresponding to the two anterior areas of congestion, before mentioned, were marked depressions, caused evidently by Pacchionian granulations that were elevated above the dura. The superior longitudinal sinus was filled with a white clot, as were most of the other cerebral vessels. When the brain was removed a large, hard tumor was found in the frontal lobes; there was no erosion of the skull below the tumor. The brain and dura were sent *en masse* to Dr. Starr, in New York, who makes the following report.

Report of Examination of the Brain: "Membranes normal. As the brain lay upon its base the two hemispheres were markedly separated in the anterior part by a tumor which projected upward and forward from the level of the corpus callosum at its anterior knee. This tumor measured 5 by 5 by 5½ centimetres. Its surface was gray and smooth where free between the hemispheres, but it merged into the tissue of the hemispheres on both sides, and had no distinct capsule, so that it could not be separated from the brain-tissue. It had no lobules. It was slightly harder to the touch than the brain-tissue. It had evidently invaded and infiltrated the two frontal lobes, growing into them rather than displacing or compressing them. To inspection the growth appeared to be symmetrical, invading both hemispheres equally.

FIG. 1.

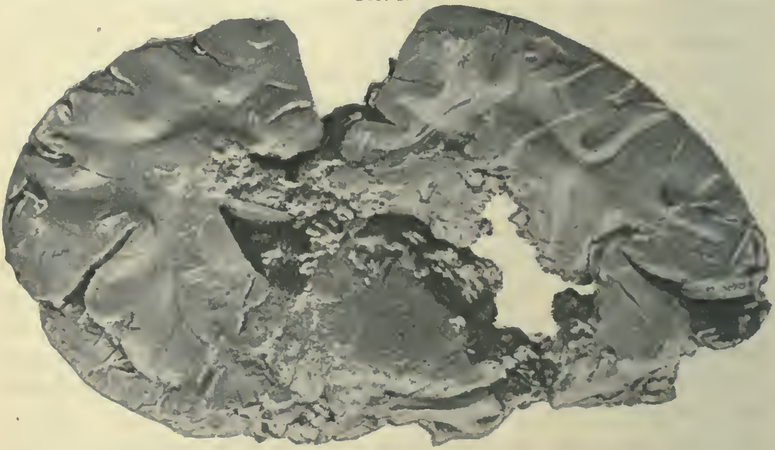
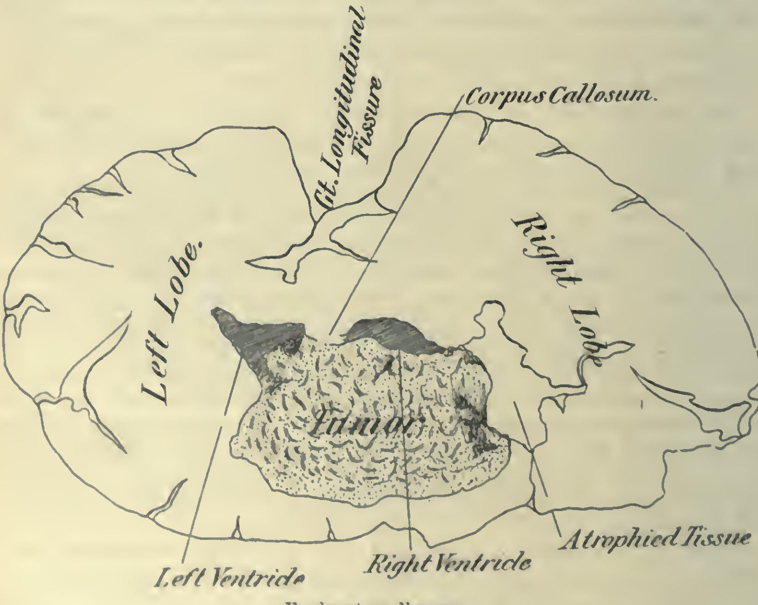


Fig. 1 shows a vertical section made just posterior to the anterior end of the tumor, *seen from in front.* The two lateral ventricles are seen with the tumor pressing into them; the corpus callosum shows its diseased and displaced (elevated) condition; the destructive effects of the growth are shown in the right lobe, where a large area of softened brain-tissue has disappeared.



Explanatory diagram.

"On turning the brain upon its upper surface the tumor could easily be seen from the base separating the frontal lobes, but not approaching the base nearly nor compressing in any way the optic chiasm or basilar structures.

FIG. 2.

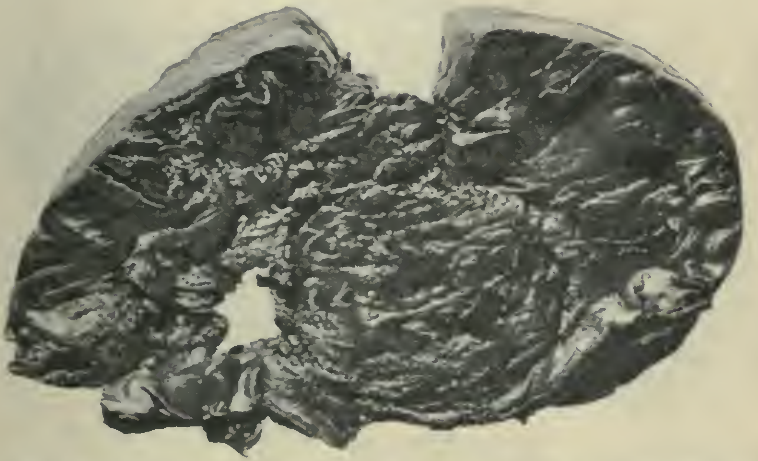
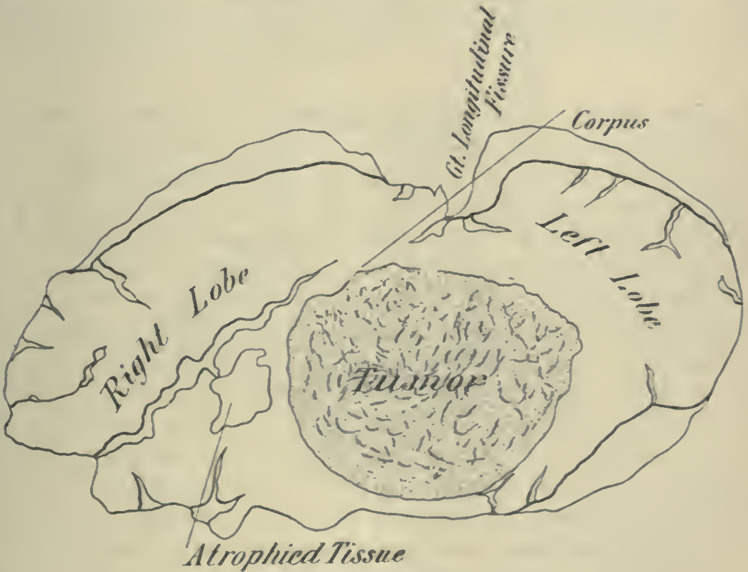


Fig. 2 shows a section made at about the middle of the tumor *seen from behind*. The disintegration of the corpus is more marked. There is the same loss of tissue in the right lobe.



Explanatory diagram.

"Frontal sections were made opposite the anterior, middle, and posterior levels of the tumor through the frontal lobes. These are shown in the photographs made after hardening in Müller's fluid. It was evident from inspection of these sections that the tumor had invaded both frontal lobes very extensively—the right to a greater extent than the left. It had extended anteriorly and posteriorly beyond its apparent

FIG. 3.

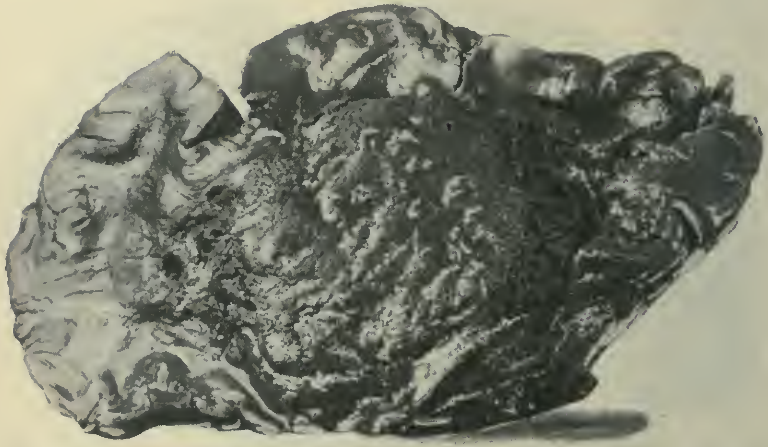
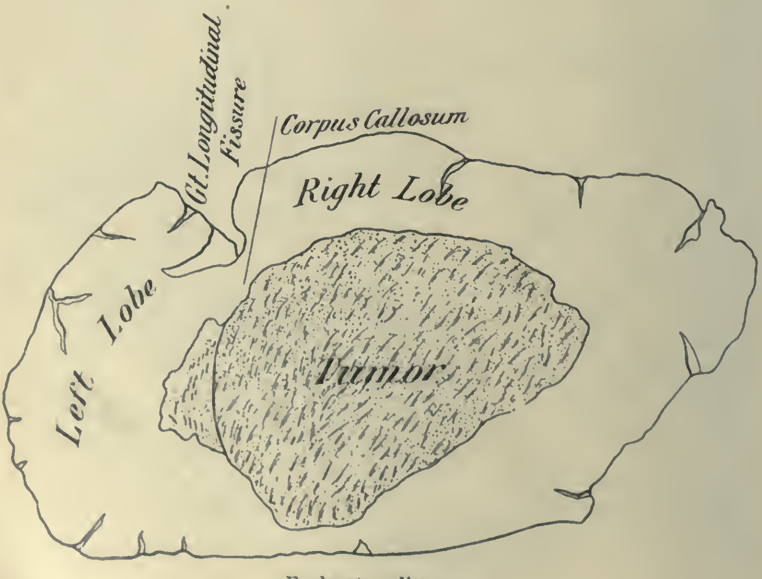


Fig. 3 shows a section made just anterior to the posterior end of the tumor *seen from in front.* A spot of softening is seen in the corpus just above the tumor.

These figures were taken at the College of Physicians and Surgeons in New York, where the sections were also made.



Explanatory diagram.

surface-limits, and had destroyed the greater part of the corpus callosum in its anterior extremity and the white matter of both frontal lobes anterior to a line drawn through the placental convolutions. It had not invaded the cortex at the posterior limits of the frontal convolutions on either side, nor did it reach the cortex in any direction excepting on the median surfaces of the hemispheres.

"The cut surface of the tumor was mottled in appearance—gray and white—with a rich supply of bloodvessels, and numerous stains indicated the occurrence of ante-mortem capillary hemorrhages. It had no very definite limits, so that its structure ran into that of the hemispheres, which on each side were very much softened just beyond the limits of the tumor. This softening was more extensive in the right hemisphere."

The microscopical examination of the tumor was made by Dr. Ira Van Gieson, of the College of Physicians and Surgeons of New York. He reports that "the tumor consists of masses of small round cells with exceedingly limited cell-bodies which lie in a delicate network or reticulum of the finest filaments. These cells are arranged in groups or densely aggregated clusters, and between such clusters there is material quite identical in structure with the basement-substance of the gray matter of the brain cortex. Interspersed among the small, round-celled clusters are great numbers of exceedingly thin-walled vessels. Thus the tumor is very vascular.

"The tumor quite uniformly shows this same structure throughout its whole extent, but in many places there are degenerative changes in the tissues. There are considerable areas of necrosis of the elements of the neoplasm; such areas are granular and fail to stain properly.

"The tumor, then, is what is ordinarily called glio-sarcoma, but is more properly called a neuroglioma."

Tumors originating in the corpus callosum are very infrequent. I have been able to find reports of only eighteen cases, the earliest one that of Mills, in the Philadelphia *Medical Times*, 1879. Berkley reports two cases in the AMERICAN JOURNAL OF THE MEDICAL SCIENCES for June, 1890, and mentions twelve others, including Mills' case, and also four that are given in detail by Bristowe in his *Diseases of the Nervous System*, where an additional one is reported. In *Neurolog. Centralbl.*, 1890, p. 251, Lutzenberger is quoted as reporting a case. Oliver gives a case in the *University Medical Magazine*, April, 1891, and Redtenbacker a case in *Aertzl. Ber. d. k. k. Allg. Krankheiten zu Wien*, 1891, p. 66, making eighteen in all.

A study of these cases has shown that they have no important symptoms in common. Berkley, in drawing conclusions from the twelve cases mentioned by him, says: "We have clearly in this summary no pathognomonic symptom that can actually refer to the corpus; headache and mental dulness are the most frequent, and no inference could possibly be drawn from them; optic neuritis is rather infrequent, certainly existing in 33 per cent., and the others occur much more commonly in disease of other localities."

The additional cases simply enforce this statement. In Oliver's case the most important symptoms were disturbance of vision (not neuritis) and hallucinations. There was no paralysis, cephalalgia, vomiting, or vertigo. The diagnosis of hysteria was considered very probable. In Lutzenberger's case there were stupidity, dulness of hearing, stammering, uncertainty of gait, and inclination to fall backward, and later an apoplectic seizure that terminated in a soporific state with abolition of the reflexes. In Bristowe's additional case the symptoms, which lasted only three weeks, were "mainly epileptiform convulsions, together with such other symptoms as are common to cerebral tumors. None of these was distinctive either of the nature of the disease or of its site."

The case I have reported coincides with the others in lack of characteristic symptoms.

Before closing I wish to express the obligations I am under to the gentlemen who have assisted me in preparing this paper, particularly to Dr. Starr and Dr. Van Gieson.

REVIEWS.

System of Surgery. Edited by **Frederick S. Dennis**, M.D., Professor of the Principles and Practice of Surgery, Bellevue Hospital Medical College; President of the American Surgical Association, Member of the German Congress of Surgeons, etc. Assisted by **John S. Billings**, M.D., LL.D., D.C.L.; Deputy Surgeon-General, U. S. A. Volume I., pp. 880. Philadelphia: Lea Bros. & Co., 1895.

Dr. Dennis has certainly done well in recognizing that the progress of surgery has been so rapid that not many years can elapse without there being a growing want created for absolutely new works of this standard and scope. There really is now no complete work in English which can be considered as the rival of this. Even the last edition of *Holmes's System* has been out too long to take note of recent advances, and the *International Encyclopædia of Surgery* never was new, even when it was first published. There is, therefore, an open field for a work of this character, andit remains to be seen how well the one under consideration may fill it. That the editor has selected his collaborators judiciously will be conceded when the names are read over. Each one of them is a teacher of surgery or a director of some large clinic, and each is, therefore, prepared to speak from an extended experience as well as from extensive study.

One hundred and thirty pages are devoted to the "History and Literature of Surgery" by Dr. John S. Billings. We doubt if in the same space a more instructive or entertaining article could be condensed. With good reason the greater portion of the article is devoted to the surgery of the last eight hundred years, from the time, in fact, of William of Salicet, Hugo di Lucca, Roger of Parma, and the Four Masters. The widespread influence of the school of Salernum is given its due importance. Most interesting is the information furnished concerning the Barbers, the Incisors, and the Cutters, as the earlier surgical practitioners came to be known. Not a little is told us about these itinerants which it would be difficult to find in any other easily accessible work. Justice is done to the great surgeons of each succeeding century and of every nationality, as well as to the history of surgery in our own country. And one may read here a brief account of the men who have contributed to make glorious American surgery.

The section on "Surgical Pathology, including Inflammation and the Repair of Wounds," is contributed by Dr. W. T. Councilman, of Harvard University. One would naturally expect to find in this the very latest statements with regard to many of the vexed problems, as well as to find an article stamped by the impress of an original worker, as its author is known to be While not following closely the old stereotyped form in order of subject-matter, the article, nevertheless, adheres rather closely to the order of topics as considered in previous treatises. One criticism which we would venture is that the old term "inflammation" is made to cover various phenomena which are widely different in etiology and in results, and that, had Dr. Councilman but chosen to make this separation, as he is so abundantly fitted to do, he would have hastened forward that day when surgical pathology will be taught in accordance with actual conditions and not according to more or less antiquated notions. With his statements, however, and his methods of their presentation no fault can be found. As between the extreme views of Cohnheim and Virchow, he seems to steer a safe middle course. In considering purulent inflammation as distinct from simple, he gives a very clear picture of actual pathological conditions, but adheres to the old and incorrect term of "pyogenic membrane," which we hope to see soon discarded for a better term. Considering micro-organisms as the active factors in producing this purulent inflammation, he suitably calls attention to the differences in their activities at different times, to the differences in the tissues upon which they may act, and presents an admirable summary of our knowledge in this regard. The repair and regeneration of inflamed parts, the production of fever as a sequence of inflammation, and the topics of thrombosis and embolism are well described. Hypertrophy and regeneration on the one hand, and necrosis, atrophy, and degeneration on the other, have been given ample consideration, as well as the other changes which are known to occur in parts which are inflamed. Tuberculosis is also taken up under this head, although its exact pertinence to this topic is scarcely made apparent. Nevertheless, an excellent pathological description of the tubercular process may be found here.

Dr. William H. Welch takes up the "General Bacteriology of Surgical Infections," a subject which could not possibly have been assigned to more competent authority. He begins by considering the bacteria of the skin, then of exposed mucous surfaces, then the sources of the bacteria involved in surgical infections, and next the portals of entry through which they may produce infection. In the pages which he has devoted to these topics is condensed a large amount of knowledge, to express which one needs not very much space, but to gather which one must have done a very large amount of special work. To the conditions favoring the development of surgical infections he has given a most deserved extended consideration, especially to those conditions which we know as immunity and predisposition or susceptibility. Fœtal infection is a subject not generally considered in surgical text-books, but one which finds a short mention here. The various bacteria of surgical infections are then taken up in detail with sufficient mention and description of each, while colored illustrations serve to portray their morphological characteristics. The entire article of Prof. Welch is one calculated to enhance his already great reputation and to add largely to the value of the work.

"The Symptoms, Diagnosis, and Treatment of Inflammation, Abscess, Ulcers, and Gangrene" are dealt with by Dr. Charles B. Nancrede, of the University of Michigan. His clinical descriptions are vivid, his therapeutic suggestions valuable, and his article, though somewhat brief, is scholarly and is made more valuable by a consideration of traumatic delirium and traumatic hysteria as complications of certain wounds and their treatment.

Dr. William H. Carmalt, of New Haven, deals with "Septicæmia, Pyæmia, and Poisoned Wounds." The general pathology of these affections having been already considered to a considerable extent in the previous articles, his treatment of the subjects refers rather to their clinical and therapeutic aspects. His descriptions are accurate and are characterized throughout by attention to those prominent features by which diagnosis may be greatly facilitated, and to which treatment needs to be most addressed.

"Traumatic Fever, Erysipelas, and Tetanus" are considered by Dr. J. Collins Warren, of the Harvard School, in whose article may be seen the same careful summarizing and the same attention to detail as are to be found in his extensive work on *Surgical Pathology*, recently issued. Our only criticism on these two chapters is that they are too short.

With "Rabies, Hydrophobia, and Lyssa," Dr. Hermann M. Biggs deals briefly but succinctly in a chapter of twelve pages. His allegiance to the Pasteur treatment by preventive inoculation is unswerving, and his faith in it seems justly abiding.

The chapter of seventy pages on "Gunshot Wounds" is furnished by Dr. P. S. Conner, of Cincinnati, a writer of great distinction and one eminently capable of properly treating this subject. He deals first with the general considerations of gunshot wounds and their immediate results so far as shock and primary hemorrhage are concerned, and then with their effects upon the various tissues—skin, fasciæ, bones, etc. He has drawn quite extensively from the published studies of La Garde concerning injuries to bones inflicted by the new bullets; and the illustrations furnished herewith are strikingly convincing as to the peculiar mechanical disturbance caused by this new missile. That the writer of the article believes in primary antisepsis and aseptic treatment of all gunshot wounds is made abundantly apparent, while all of his own recommendations are most wise and based upon an extensive experience and study of results by different methods. Very brief space is devoted also to wounds inflicted by swords, bayonets, and arrow-heads.

The general subject of "Fractures and Dislocations" is handled by Dr. Dennis, the editor of the work, who, in the seventy pages allotted to this topic, seems to have epitomized the subject as but few writers can. Those who are familiar with his magnificent work in the treatment of compound fractures will appreciate the force with which his statements are made and the weight which his advice should carry. An admirable catalogue of the untoward consequences, early and late, during and after repair of fractures, will be read with very great interest. Especially with his advice concerning the treatment of fractures of the neck of the femur is the reader likely to be most pleased. In discussing dislocations but little space has been given to the very interesting congenital forms, which leads us to expect a further consideration of these special forms in the succeeding volumes. Many of his illustrations, especially those representing dislocation of the femur, are both new and admirable.

Dr. H. C. Wood, of Philadelphia, deals with the general subject of "Anæsthesia," thirty-two pages of the present volume being devoted to this most important topic. After the usual general considerations concerning the safety and dangers of various anæsthetics, and a description of some of the new and rarely used substances, we find definite advice concerning the circumstances which should modify the choice of an anæsthetic, a description of the most prominent after-effects, followed by positive and unmistakable directions as to their administration. One statement made here is italicised in the original and deserves a repetition in this place:

"It should be an unalterable rule of practice that no alcohol should ever be given to a patient suffering from anæsthetic cardiac failure."

And Dr. Wood expresses himself as having no doubt that not a few of the deaths attributed to ether and other anæsthetics have been in fact due to the alcohol which had been given to the patient. Again,

"If in the course of anæsthesia cardiac failure results from hemorrhage or other surgical cause, alcohol may seem to some surgeons to be indicated; but under these circumstances any good effect which would be obtained by alcohol would be more rapidly reached by the further administration of ether."

A little further along he states his positive opinion that in all cases of weak heart a full dose of digitalis given hypodermatically before the administration of chloroform would greatly lessen the danger of cardiac collapse. The importance of many of his statements, of which the above are but a few examples, will lead, we have no doubt, to the most careful study of Dr. Wood's contribution.

The "Technique of Antiseptic and Aseptic Surgery" is dealt with at considerable length by Dr. A. G. Gerster, of New York, already so well known from his writings on this as on other subjects. To the epitomized suggestions and directions which he has made here there is but very little which could be added in an article of this description.

The concluding part of the volume is an article of one hundred and thirty pages or more on "Operative Surgery," by that veteran, Dr. Stephen Smith. The subjects mainly included are operations for the prevention and control of hemorrhage, the resection of bones and joints, and the various amputations. It is, perhaps, enough to say of this that all of those recent methods which have been applicable and whose efficiency has been tested have found here suitable description. The article is made still more valuable by a few pages devoted to compensatory appliances and prosthetic apparatus.

It may hardly seem fair to judge of an entire work by the first and introductory volume, and yet if the three volumes which are to succeed this, according to the publishers' announcement, are to be as replete with information and as abreast of the times as this one already furnished, the editors, the publishers, and the profession at large may be warmly congratulated, and we may feel that a long-felt want for some such general treatise has at last been supplied. The illustrations are excellent, the type and paper of the best quality, and the general make-up of the volume is well calculated to please, while of its durability there can be no doubt. R. P.

SURGICAL PATHOLOGY AND THERAPEUTICS. By JOHN COLLINS WARREN, M.D., Professor of Surgery in Harvard University. Octavo, pp. 832. Philadelphia: W. B. Saunders, 1895.

THE appearance of a new English surgical pathology and therapeutics, especially when it is by the Professor of Surgery in Harvard University, is an event of some importance. Prof. Warren's book justifies also the statement by its contents and appearance. Of the numerous illustrations all but two are original; and we think the book is the handsomest specimen of book-making, as to paper, printing, and illustrations, that has ever been issued from the American medical press

The scholarly tendency of the author is illustrated at the very beginning by the substitution of an apt Virgilian quotation instead of a dedication, and throughout the book there is the best evidence of his broad culture and wide knowledge. We note with pleasure that he uses cocaïne, ptomaïne, etc., as trisyllables and not dissyllables, as is so often the case.

The book deals with pathology and therapeutics, and incidentally very largely with symptomatology as well. It represents, therefore, both the scientific and practical side of surgery, and should it have, as we hope, a large sale among medical students as well as medical practitioners it will go far toward forming the future practitioners and students in an improved mould from those of the past.

It does not, however, strike either the eye or the ear pleasantly to see him disguise a proper egotism by using the term "the writer" instead of plain, simple, Saxon "I."

When one contrasts this book, the *American Text-book of Surgery*, and Senn's recent publications with those of Agnew, Bryant, Gross, Erichsen, etc., the first striking peculiarity is that the modern books lay a foundation in the very opening chapters in surgical bacteriology. Warren has illustrated this very well, and treated it very fully. Following this comes the consideration of simple inflammation, in the consideration of which he very properly excludes, according to our present views, any idiopathic form, but brings into some prominence the nervous as well as the bacterial factor, then of the infective inflammations, then the process of repair the complications of wounds, the specific infections, including tetanus, hydrophobia, actinomycosis, etc., after which follows a consideration of tuberculosis, diseases of bone, and tumors. The work concludes with a chapter on aseptic and antiseptic surgery, and an appendix on blood-serum therapy; the treatment of cancer; preparation of erysipelas toxin, and some points on surgical technique.

We regret that he has not made the book cover the whole field of surgical pathology. Nothing, for instance, is said as to appendicitis, the various forms of intestinal obstruction, the surgical disorders of the kidney, or any other abdominal disorder.

In one respect we are disappointed in the chapter on inflammation. The whole question of treatment is dismissed with three pages, practically consisting of local bloodletting, arterial sedatives, heat, cold, and counter-irritation. Nothing whatever is said as to purgatives, diuretics, diaphoretics, anodynes, diet, etc. Surely, in a book on surgical therapeutics, in which hospital gangrene (a disease practically now extinct) has twenty-five pages given to it, the surgical treatment of inflammation is very inadequately considered. In an American work, also, the name of the professor of surgery at Johns Hopkins University ought not to be misspelled (p. 150). So, too, we notice repeatedly the misspelling of the names Ballance and Edmunds, who are always alluded to as Ballance and Edwards (pp. 220 and 254, twice), and the well-known German writer Tillmanns, is misprinted as Tillmans (pp. 383, 385, 401, 405).

We are glad to see so much importance given to acute osteomyelitis, especially as a frequent cause of necrosis; moreover, the surgical treatment, especially where he insists on the importance of trephining the bone, precisely meets the indication, and anything short of that is an imperfect operation. Many limbs have been saved, and, as he points out, many museums despoiled of what would have been otherwise, fine specimens of bone containing sequestra, by such radical treatment. We notice, however, that in recommending the Esmarch bandage as an adjuvant to the operation that the author does not urge upon his readers the important precaution of not applying it over the diseased part lest the infection be forced into the system.

The description of shock by the author is very excellent, and shows that he is only too well acquainted with this formidable complication in this country. The curious absence of shock in some countries, especially in the Orient, does not seem to have attracted his attention. The missionary physicians in Madagascar, and numerous surgeons in Egypt, Hindostan, and so on have noted this fact, which is undoubted. We observe with approval that he doubts the existence of secondary or delayed shock, and attributes it to fat-embolism, or septic infection, though he recognizes the fact that there may be protracted shock.

We are glad to see that he has re-echoed the cry which Dr. Cheever raised some years ago in the American Surgical Association against the needlessly prolonged operations of many surgeons, and urges all haste consistent with thoroughness, and also advises special care in the conservation of the body-heat. We should have been disposed to insist somewhat more on the use of strychnine as a remedial agent, and very frequently give it in doses of gr. $\frac{1}{20}$, repeatedly administered during any prolonged operation.

Time and space do not permit us to take up the remainder of the volume. Suffice it to say that we have read the whole book through with the greatest possible profit and interest, and to all of our junior practitioners, and those in the country who are not familiar with the rapid strides of surgical pathology in the last few years, we can unhesitatingly recommend the book as a safe counsellor and an instructive friend.

W. W. K.

ATLAS OF THE DISEASES OF THE SKIN, in a series of illustrations from original drawings, with descriptive letter-press. By H. RADCLIFFE CROCKER, M.D., F.R.C.P., Physician to the Department for Diseases of the Skin, University College Hospital, London, etc. Edinburgh, London, and New York. New York: Macmillan & Co.

THE name and high reputation of the author of this work are in themselves sufficient guarantee for excellence. A careful inspection of the plates and letter-press of Parts I. and III. of the *Atlas* before us bears out the truth of the opinion just expressed. The work is in every way worthy of the distinguished author and of the subject. Dr. Crocker has been known for twenty-five years as a hard-working, conscientious laborer in the field of dermatology. In his writings he impresses the reader with the idea that he has something of importance to communicate, and moreover that he desires to convey that information in the most practicable and straightforward manner.

The *Atlas* is got up by the author and publishers on a grand scale, the plates being life-size, and well drawn and colored. The cases selected for representation are varied, some illustrating common forms of disease, others rare manifestations.

Fasciculus I. contains three portraits of erythema multiforme, one of dermatitis gangrænosa infantum with varicella, one of miliaria infantum, one of ichthyosis of trunk, four of xanthoma (planum, palpebrarum, lineare palmaris, tuberosum of knee, congenitale of abdomen); one of lupus vulgaris with epithelioma, and two of scabies. To an American observer it is interesting and instructive to note the types of diseases portrayed, some of which differ in certain particulars from the same varieties of disease as met with in the United States. Thus the cases of erythema multiforme show lesions which are considerably bolder and more elevated than met with here; indeed, the reviewer cannot recall having ever seen lesions so boldly developed in this disease. The case of ichthyosis simplex of trunk is unusually brown for this variety of ichthyosis, and the artist has failed to depict the presence of epidermic scales successfully. This we regard as the most unsatisfactory portrait, both as to subject and coloring, in this fasciculus. The xanthoma plates illustrate admirably the diversity of forms which this disease takes on, and give a good idea of the subject as a whole. The portrait of lupus vulgaris with an epitheliomatous tumor springing from the cheek shows a rare but well-known combination of two distinct diseases—lupus vulgaris and cancer. Another unusual picture, one almost unknown in the reviewer's experience in this country, is scabies of the scalp in an infant, where the inflammatory discrete vesicular lesions exist in great profusion and are as well marked upon the scalp and face as upon the trunk and arms. It is questionable if even an experienced observer would be prepared to make a diagnosis from this picture, for the secondary lesions which usually so soon appear in scabies are altogether absent here. The lesions depicted resemble those of rather miliaria vesiculosa rubra.

Fasciculus II. contains two representations of urticaria papulosa, one showing the early urticarial stage, the other a later stage, with excoriated papules and crusts. This form of urticaria is perhaps commoner in Great Britain than elsewhere, and has been much written about in that country, but in the United States it does not seem to be so common nor so intractable as English authors state is the case in their experience.

Next we note three portraits of lupus vulgaris, two of which, occurring on the buttock and thigh, may be regarded as somewhat unusual growths and of a much brighter red color than is usually encountered in lupus. The author distinguishes between lupus vulgaris and scrofuloderma, and gives three pictures showing the latter affection, one being the typical common "chronic scrofulous ulceration" of the neck, another lupus verrucosus of the knuckles, and the third verruca necrogenica. The last shows an exaggerated form of this affection, with hard, greenish-crusted, fissured plates over the knuckles. Another plate shows an extraordinary case of keloid following scar, the lesion covering the whole shoulder and part of the arm.

Two illustrations of "seborrhœic dermatitis" are presented; one shows the disease upon the side of the face and upon the scalp, and by most observers in this country would probably be regarded as being eczema; Dr. Crocker designates the disease as "seborrhœa eczemaformis." The other illustration of seborrhœic dermatitis shows what has long been well recognized in the United States as "seborrhœa sicca," *faciei et corporis*, according to the region invaded. It is a distinctly seborrhœic process, which seldom assumes an eczematous nature. It is a well-defined disease, and we are pleased to see such a good portrait of it; but it would serve a better representation of the disease as met with here, if the skin were more greasy and scaly or crusted.

Fasciculus III. takes up the subject of lichen planus, the four portraits given illustrating the subacute and chronic forms as they affect the skin and the mucous membrane. The drawing and coloring of these plates are not altogether satisfactory, the lesions of the usual form of the disease, as shown on the forearm, being more elevated and whiter than is the rule. All of the cases portray unusual rather than common forms of lichen planus, a disease which occurs more frequently probably in England than in any other country. Next we note a rare form of bullous iodide eruption, in which the lesions have the appearance of being fungoid rather than bullous. The case is instructive. Two portraits of arsenical pigmentation and two of arsenical keratosis follow, all being of interest. There is also a striking picture of "lupus erythematosus sebaceus," in which the sebaceous crusts are pronounced and thick, and the zone of inflammation around the patches very active. Acne varioliformis is a rare manifestation, of which there are three portraits given. The affection is usually confounded with acneform syphilis, to which, on account of the punched-out, crusted, ulcerative lesions, it bears close resemblance. The characteristic symptoms of the disease are the varioliform scars which the pustules leave, the tendency to affect the forehead at the border of the scalp, tendency to recur, chronicity, and the comparative dryness of the necrotic process.

We commend the *Atlas* with warmest praise to all interested in dermatology. It bids fair to be a monumental work, and it should receive a generous reception at the hands of the profession at large. The form is dignified and grand, the paper highly calendered and thick, the type large and excellent. The letter-press takes up each disease in a practical way, describing first the characteristic symptoms and features, followed by a brief history of the case portrayed, together with appropriate remarks upon the diagnosis of the disease viewed as a whole. We trust that with the completion of the work the names of the artists who have done such good medical painting will be given. L. A. D.

TRAITÉ ELEMÉNTAIRE DE CLINIQUE THÉRAPEUTIQUE. Par le Dr. GASTON LYON, Chef de Clinique Médicale a la Faculté de Médicine de Paris. Paris: G. Masson, 1895.

AN ELEMENTARY TREATISE ON CLINICAL THERAPEUTICS. By GASTON LYON.

IT has only been within the last few years that books upon therapeutics have been written, not from the position of the drug, but from the standpoint of the disease to which the drug is to be applied. Several works have been published in this country and abroad which have covered this field of medical literature quite thoroughly, and we now have presented to us a very useful, carefully prepared, and excellent volume by Dr. Lyon, which is perhaps the most exhaustive book of its kind by a single author which exists to-day, covering as it does nearly 1000 pages of closely printed text.

The diseases are divided systematically into those of the digestive system, the respiratory system, etc., and nearly every article teems with prescriptions which the author has found of value or more commonly extracted from the writings of men who are usually ranked as authorities in special branches of medicine.

In many of the articles the symptoms of the diseases are so carefully described and the pathology underlying these symptoms so thoroughly discussed that the application of the remedial agents which follow is not only rational but encouraging to the physician who desires to follow the advice of the author, not blindly, but with a clear understanding of what he is doing. Under the article on gout we note that the author writes quite exhaustively concerning the ordinary remedial measures, and then discusses the treatment of this affection by the various springs which he believes to possess particular value, classifying them according to the many forms of gout which present themselves to the practitioner. Thus he suggests that for acute gout, which is comparatively recent and has attacked vigorous subjects, that the springs of Vichy and Vals are to be resorted to; while in the subacute form, in which there are congestion of the liver and intestinal atony, Carlsbad and Chatel-Guyon are recommended. In those cases in which there is pulmonary or diabetic trouble a visit to Royat is desirable, and should gravel be present Contréxeville, Evian, and Vittel are advisable. Should there be chronic gout with articular involvement and a deposit of tophi he suggests Bourbonne-les-Bains and Plombieres.

In the treatment of an acute attack Lyon believes that absolute immobility of the part, with the use of an ointment composed of ten per cent. of salicylate of sodium in lanoline, is very useful; and he also advocates that the carbonate or benzoate of lithium shall be given in some hot, aromatic infusion. With the tincture of colchicum he advises that we combine tincture of aconite root, jalap, and cinchona.

The author is careful to point out from time to time in the text that various medicaments are needed in the different stages of the disease as they present themselves. In speaking of paralysis agitans and the various forms of tremor, he details treatment which he thinks suitable in each particular case, and we note that, unlike many other Continental writers, he has been careful to go beyond the therapeutics of his countrymen and to quote from the writings of laborers in foreign fields. Thus, under the remedies which he particularly regards as of value in the tremors of paralysis agitans we find sulphate of sparteine, borax, duboisine, picrotoxin, and hyoscyamine, and we are glad to note that he gives the credit for the use of the sulphate of sparteine to Dr. Potts, of Philadelphia. Personally we have always found that hyoscine was preferable to any of these remedies, and we notice that Lyon suggests its employment, particularly if insomnia be present. We find an error, however, in that he orders a solution containing hydrochlorate of cocaine and borax (instead of boric acid), forming, of course, thereby a chemical incompatibility.

Taking it all in all, the book may be characterized as one which is thorough, practical, carefully prepared, and singularly free from the many errors, typographical and otherwise, which are so apt to creep into the literary productions of our French brethren, particularly in regard to their spelling of proper names. The book will naturally fail to have a large sale in this country, both because its field is well filled, and because it is in the French language; but we doubt not that it will be very popular in France, as it deserves to be. H. A. H.

Clinical Gynecology, Medical and Surgical, for Students and Practitioners, by Eminent American Teachers. Edited by John M. Keating, M.D., LL.D., and Henry C. Coe, M.D., M.R.C.S., Professor of Gynecology, New York Polyclinic. Illustrated. Pp. xviii., 994. Philadelphia: J. P. Lippincott Company, 1895.

Considering the immense advance in gynecology during the past twenty years, together with the many and necessarily rapid changes in methods, no apology is needed for the appearance of the present or any similar volume. A book on this subject two years old, unless thoroughly revised, is out of date, and does not contain the best teaching to be obtained. Nor does this shifting indicate any lack of stability or consistency in the profession; it is merely what is true of the perfection of anything worth perfecting—it means that everything rational must be weighed and tried before professional opinion can become settled on a sure and permanent basis.

Much criticism has been expended on systems, and not a little condemnation has been meted out to them. It is quite certain, however, that no one man can write so good a book as a number of men writing conjointly. Every man has his hobbies and weak points, which not infrequently carry him into absurdities and failures. Most men are interested in a certain few subjects in their branch of study, and give much thought to these, to the exclusion of all else. Such a one writing a book will almost surely produce two or three chapters which show brilliant thought, hard work, and honest conviction; the remainder of the book, which would otherwise have been a brilliant one, is ruined by being practically copied from other and older works. The consequence of all this is that our older text-books are so full of false and absurd teachings as to render otherwise good works useless for the instruction of the present day. An able editor, carefully picking his associates, and assigning them work in their proper sphere, can for these reasons produce a book far superior in value to the profession to that of the ordinary individual—and this the more so if he fearlessly uses his editorial pen after the manuscript has come into his hands, deducting, adding, and harmonizing wherever needed.

In this respect the editor of the present volume has been considerably hampered, inasmuch as the work had been well advanced before he was called to continue what had been begun by the late Dr. Keating. No one can fail to appreciate how difficult must have been the task of taking up and finishing the work of another, aiming at the same time to retain the individuality of the former editor and to do justice to one's self. The consequence of this dual editorship has been the production of some faults—remarkably few under the circumstances, and yet such as would not, we feel sure, have occurred otherwise. This fact only serves to emphasize the ability with which the editorial part has been handled.

The book contains much which is excellent, and in most of its departments is well up to date. Its faults are such as could easily be eliminated and the work made worthy of the place it should hold in gynecological literature; as it stands, it must be revised or fail. It is an unfortunate fact, but a fact, nevertheless, that a little bad may spoil the whole, even though the bulk of the whole be good. This becomes the more so when the bad is found at such important points as in the chapters on "Inflammatory Lesions of the Pelvic Peritoneum" and "Displacements of the Uterus," subjects so important that a correct knowledge of a great mass of gynecological lesions depend upon a proper understanding of the etiology, pathology, and treatment of the subjects dealt with under these headings.

The work opens with an introductory chapter by the late William Goodell. This chapter represents the last of the literary productions of this gifted writer, and is in all respects worthy of his pen. It gathers into a compact form his views on a number of the mooted questions of the day. It serves to emphasize his teaching on these subjects, while not deviating from his views in a single instance as enunciated by him during the past few years. With all of these we can agree in part, with many of them in whole, but a few must remain open to future question and proof.

Chapter I. treats of "Methods of Gynecological Examination" in a manner which is worthy of its author. The subject is gone into very thoroughly, and the teaching is for the most part sound. We are especially glad to note the emphasis given to the too universally committed errors—viz., the too frequent and unnecessary examination of young unmarried women, and the neglect to examine married women who are evidently suffering from pelvic trouble. This seems to be a peculiar freak of human nature with which we are all familiar—the doing what ought not to be done and the failure to do what ought to be done. It would seem that too much stress cannot be laid on this point. The uterine sound is properly condemned as a means of replacing a uterine displacement, and it had been better had its use been altogether discountenanced rather than recommended to the younger and unskilled physician. It is by the unskilled that damage may be done by the use of this useless instrument; it is safe enough, although unnecessary, in skilled hands. Examination under ether is the proper resource for clearing up doubtful points—the less the skill the greater the necessity. The use of graduated bougies, as recommended, as the first step in curettage is not the best. If the steel instrument of Goodell is to be used preliminary to the graduated bougie, the question may well be asked, Why not continue with it? Under any circumstances they are preferable, as causing less traumatism and less hemorrhage. Digital examination of the bladder, with the finger introduced through the urethra, is to be condemned; and, on the other hand, we must affirm that vesical inspection of the interior of the bladder by means of the cystoscope *is* within the means of the ordinary physician, and *does not* presuppose special skill and opportunities. Further, it is the *only* proper method. It is a matter of congratulation that the authors have given their sanction to nude illustrations of the various gynecological positions. It is absolutely impossible to teach these positions otherwise. Those who see anything immoral in them had best look to their own morals.

"Technique," as taught in Chapter II., is excellent as far as it goes, but it does not represent the methods as adopted by the great majority of American and European surgeons. The nail-brush, hot water, and soap, followed by alcohol or ether or both, and finally a bichloride of mercury solution, have stood the test of time in spite of their once threatened rivals permanganate of potash and oxalic acid. The former are to-day used by three surgeons where the latter are used by one. It therefore seems that the method should be given a somewhat more prominent place in this chapter, instead of being practically condemned. The work is a reproduction of that excellent little book of Robb's on the technique at Johns Hopkins Hospital. It is to be noted that Trendelenburg's position is condemned. A fact worthy of note in this connection is that since the writing of this chapter the powers at Johns Hopkins have pronounced in favor of and have adopted the position; in addition, every other chapter in the book which mentions this matter strongly urges its use. It seems hardly conceivable of one having used and rejected it.

Chapter III., "Outlines of Gynecological Therapeutics," is remarkably accurate and thorough until it comes to deal with electricity and massage. An unusual number of useful hints are here to be found; in fact, a good deal to which it is usual to pay little or no attention in text-books—that portion which is of especial interest to the general practitioner. In massage the author seems, contrary to general experience, to have found a useful measure. We can see little harm in following his directions as to its use, especially as he is careful to give the counter-indication. It is sure that any one trying it even under these directions will soon give it up as useless. When the author recommends it as a means of breaking up adhesions, however, a decided note of warning is necessary, as it is absolutely powerless for this purpose and is equally dangerous. We are pleased to see how vigorously the attempt to tear up forcibly adhesions from the vagina is condemned. Five lines are devoted to the names alone of the diseases to which the use of electricity, either as a destructive or as a constructive agent, is applicable; then follow twenty or more pages on the usefulness of this agent, when the truth about it could be told in twenty lines.

The chapter on the "Anomalies of Development in the Genital Tract" is an unusually good and full one, and contains all one would expect to see in such a chapter.

The chapter on "Traumatic Lesions of the Vulva, Vagina, and Cervix" is well handled, as would have been expected from the author. We note the fact that Emmet's operation for laceration and relaxation of the perineum is preferred, and Emmet's theory as to the etiology upheld. It would seem, however, as though too much stress had been laid on median tears, for the reason that they occur so seldom, excepting as complete sphincter laceration. It is a matter of surprise, also, that the teaching is rather to neglect immediate repair of a torn sphincter. We had thought there was a unanimity of opinion in favor of that procedure. The theory that cancer of the cervix is caused by laceration is very properly condemned, and consequently immediate repair of this lesion is not advocated; proper attention is also given to the danger of trachelorrhaphy, even in chronic cases, in the presence of old pelvic inflammatory troubles. Again, we find the Emmet operation preferred to the amputation which is so common in the hands of the Germans.

"Inflammation of the Female Pelvic Organs" is an excellent chapter, and is for the most part in harmony with modern ideas on this subject. Trendelenburg's position is naturally approved. Cellulitis is considered only as secondary to peritonitis, and peritonitis is acquired by direct infection through the Fallopian tubes. It were well had the handling of these subjects remained in this chapter where the teaching would be found in harmony with the rest of the book and with modern pathology. No one is better able to deal with the inflammatory diseases of the uterus than the author, and the whole subject will be found well and thoroughly presented. It is noteworthy that all other causes of these pelvic inflammations are relegated to the background excepting septic and specific poisons, and of these those caused by septic poisoning in the gravid womb far outnumber those caused by gonorrhœa. This is unquestionably true. We find again in this chapter a recommendation of the use of massage in the treatment of the chronic salpingitis cases, a recommendation with which we are unable to agree.

The chapter on "Genital Tuberculosis" is the best and most practical we have ever seen. It is short, concise, and to the point, and the author has shown great good sense in not overburdening it with scientific discussion.

The teaching in the chapter on "Inflammatory Lesions of the Pelvic Peritoneum and Connective Tissue" is in marked contrast with the teaching on the same subject in the other parts of the book. It is unnecessary to go into detail; suffice it to call attention to the fact that Goodell, Mann, Polk, and Coe, in their respective chapters, have all considered the subject from another—the modern—point of view. The reader, if he accepts the teaching on this subject as found in the other parts of this book, must of necessity reject the teaching of this chapter. Goodell puts the matter very tersely when he says (page 2): "The crucial test of surgical researches—an appeal to touch and sight, which cannot be gainsaid—has shown that cellulitis is almost a myth, and that what have long been deemed exudative tumors and inflammatory deposits in the areolar tissue are tubal and ovarian lesions. Yet error dies hard, for 'truth new-born looks a misshapen and untimely growth; and there are a few medical Uzzahrs who still perilously uphold their tottering theory of cellulitis." The one great mistake the editor has made is that he has failed to strike his pen through the whole of this chapter, and thus eliminated it entirely from the book of which it is the greatest defect. Twenty years ago we would have expected the chapter; to-day there is no room for it in any gynecology.

The chapter on "Displacements of the Uterus" is another great disappointment, although it is a marked advance on the past teaching of the author. He deplores the fact of his past errors in placing too much stress on displacements *per se* and his recommendation as to treatment, promising better things, and then at once proceeds again to place before us much of the past which he had given us hopes he had done with. The vast majority of uterine displacements are only complications or symptoms of some more deep-lying disease, and it is an open question whether it is any more proper to devote a chapter to their consideration than it is to cellulitis or dropsy. Certainly, considered from the standpoint of the *primary* lesion, there can be but the one opinion. It is more than doubtful whether ante-displacements cause dysmenorrhœa or sterility; usually it is the accompanying endometritis which is responsible. Mechanical supports may keep the uterus in an anterior position in a few cases, but the contrary is true of the vast majority. These supports are not only useless in the presence of adhesions, but actually and actively harmful. We are somewhat surprised to find anteversion most frequently in women who had borne children, our experience having been that the reverse was the case, and we were under the impression that every one had long since discarded pessaries of all kinds for anterior displacements. The cauterization of the uterine canal with chloride of zinc (50 per cent. solution) after a curettement, except in the presence of malignant disease, seems hardly justifiable. The indiscriminate and prolonged use of the stem pessary seems fraught with too much danger to be passed by without a warning. After all these recommendations for the treatment of anteflexion (a perfectly normal condition) the author states: "I cannot say that my own results have been very satisfactory in the treatment of this form of uterine displacement." A little less attention to the local and a greater one to the constitutional condition of the patients would possibly have produced different results. Of the seven complications detailed as accompanying retro-displacements five are open to very serious question. In fact, these complications are unquestionably due to a complicating infection either septic or specific, and not, as stated, to either friction or pressure or a changed state of circulation. How a displacement backward will *per se* cause a sterility is inconceivable, unless we go back to the old theory that the semen is ejaculated directly into the cervical canal. We must most emphatically dissent from the view that if a woman is sterile for years and a retro-displacement be found, there is necessarily a relation of cause and effect. It hardly seems necessary to say that, as all the symptoms of a retro-displacement usually come from the complicating disease, treatment should be directed against this disease whatever it is; consequently, the amount of space and attention devoted to pessaries seem somewhat superfluous. In fact, throughout too much stress is laid on the displacement, too little on the complicating disease; for this reason, undoubtedly, Alexander's operation is preferred to hysterorrhaphy, a position with which few will agree. Lateral displacements never occur excepting through inflammatory shortening of the broad ligaments and thus it is the broad ligaments and appendage which need attention, and not the uterine displacement. We are pleased to note that massage and electricity for prolapse are condemned.

Neoplasms of the vulva and vagina have received full and satisfactory attention. There is little wanting in this chapter. Under the heading "Benign Neoplasms of the Uterus" we find that the hypodermatic injection of ergot is recommended for fibroid growths. It would seem the little good to be obtained by this method over a use of the drug by the stomach should have precluded this recommendation, especially in face of the dangers of the hypodermatic method. It is certainly unwise to put the needle in the hands of the patient herself when "*abscesses are avoided only by strict attention to asepsis*," and an ordinary mortal might be excused for discarding the treatment altogether when "it may require two hundred injections before any marked benefit is noticed, and, in all probability, from one to two thousand will be needed." It would seem that even electricity, which on the same page is very properly rejected, would be better than this. The vaginal operation for removal of small fibro-myomatous uteri is recommended, and it is stated that "it is rare for small tumors to produce such serious symptoms as to require this mutilating operation." Few will be found to agree with these statements. The vaginal operation is far more difficult than that through the abdominal walls, and it is a well-known fact that the small pelvic-bound tumors are the very ones which give the more severe symptoms. The author leans toward castration in certain cases rather than removal of the uterus, but in this we are unable to agree. Supra-vaginal hysterectomy with extra-peritoneal treatment of the pedicle is recommended when it is desirable and necessary to save time. If the operation be performed as described in the text, no time will be saved over an amputation at the neck and dropping of the stump. The author gives his preference to pan-hysterectomy over all other methods. Trendelenburg's position is properly approved, although condemned in the chapter on technique, the author of which chapter stands alone in his opposition. Adenoma as a benign growth is found in this chapter. It does seem time for all adenomatous growths to be grouped as malignant; the pathologist tells us the refined differences between the benign and the malignant, and yet clinically we continue to see our supposed benign adenomas present all the characteristics of malignant conditions, and not infrequently see them die later of what clinically we can only call malignancy.

"Malignant Neoplasms of the Uterus" is a good chapter and in it little is to be found wanting. We can hardly share the author's confidence in being able to distinguish diagnostically between the beginning malignant and inflammatory thickening of the broad ligaments where the uterus is malignant. We are of the opinion that it is best to undertake no operation when there is infiltration of these ligaments. Neoplasms of the ovaries, tubes, and broad ligaments have received the amount of intelligent attention we would expect from the author. The chapter is one of the best in the book, and is thoroughly modern in all its teaching. The chapter on "Ectopic Pregnancy" is on the whole good, although the author can hardly expect that a record of sixteen cases, with three deaths, will tend to induce the profession to adopt the treatment of injecting the sac with morphia, or anything else. We note that ovarian pregnancy is accepted as a fact, that the early diagnosis is easy, and that electricity is recommended; with none of which points are we able to agree. Functional diseases have been well handled, and the chapter can be taken as a safe and reliable guide in these matters. The remainder of the book is made up of "Diseases of the Urethra, Bladder, and Ureters," "Diseases of the Rectum and Anus," "Diseases of the Female Breast," and "Cutaneous Diseases Peculiar to Women," none of them strictly gynecological subjects, but all well and briefly presented. The volume is illustrated by numerous woodcuts and half-tone plates, well executed. One criticism can be offered in this direction, which is a serious one. It is not only in bad taste, but savors most emphatically of advertisement to allow the face of the operator to appear in the illustration. It is to be hoped in future editions this feature will be eliminated.

The book, taken as a whole, is one which will be indispensable as an addition to the library of all interested in gynecology. J. M. B.

Dissections Illustrated. A Graphic Handbook for Students of Human Anatomy. By C. Gordon Brodie, F.R.C.S., late Senior Demonstrator of Anatomy, Middlesex Hospital Medical School; Assistant Surgeon Northwest London Hospital. Plates drawn and lithographed by Percy Highley. New York: Macmillan & Co.

This fascicle of Dr. Brodie's elaborate work contains nineteen colored lithographs of the anatomy of the parts indicated in the title. The plates are effective and give every evidence of careful study and attention to details, though, as is commonly the case, they resemble diagrams of the natural parts rather than dissections. The description of the plates is further illustrated by a number of uncolored woodcuts giving in detail the distribution of nerves. The clinical relations of the pleura and pericardium, the relations of the lateral sinuses to the mastoid processes, are also outlined. The work can be specially commended to the attention of students of medicine and surgeons. H. A.

Operative Surgery. By Theodore Kocher, M.D., Professor at the University and Director of the Surgical Clinic at the Berne University. 163 illustrations. New York: William Wood & Co., 1894.

This is the only operative surgery in the English language which, so far as we know, covers so large ground. Part I. deals with general observations upon anæsthesia, the treatment of wounds, selection and direction of the incision. This latter section of the first part is extremely interesting and is of importance as helping to decide the proper direction for the incision through the skin.

In Part II. special operations are considered, and in Part III. excisions of the lower and upper extremities are described. Part IV. deals with amputations, exarticulations of the lower and upper extremities.

It is impossible to describe in detail the various parts of the book because of the very minute descriptions into which the author enters regarding each operation, especially upon the arteries and nerves. His methods for the various operations are those usually accepted as the simplest and most satisfactory.

We know no operative surgery which goes so much into the detail of nerve operations as this does. The illustrations, as a whole, are poor. Those illustrating cranial surgery are the best in the book. On the whole, the book is of value as a reference-book for the busy operator.

C. L. S.

PROGRESS
OF
MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

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THE TREATMENT OF TYPHOID FEVER.

DR. LE GENDRE does not believe that every case should be treated exclusively and indiscriminately by cold water, but when hydropathic measures are indicated he does not hesitate to make use of them. The principal elements which should be considered in treatment are the hygiene of the sick-room, the instruction of the attendants, the care of the skin, and the antisepsis of the mouth and natural cavities. The teeth should be brushed each day with an antiseptic powder composed of boric acid, 1; powdered red cinchona, 1; powdered calcium carbonate, 2; powdered magnesium carbonate, 2, with sufficient essence of mint to flavor it. Afterward the mouth should be rinsed and the patient gargle with borated water (saturated solution), flavored with mint or thymol. If the patient is too ill for this, the throat may be irrigated or sprayed. The sordes may be prevented and the teeth cleaned with lemon or with a bit of cotton moistened with sodium or potassium chloride, 3; glycerin, 15; and water, 15. For the nose a 10 per cent. solution of borax in vaseline or oil of vaseline may be used. Antisepsis of the large intestine may be obtained by irrigation, morning and evening, with a quart of borated water (saturated solution) or cold naphtholated water, 1 to 5000. The stools should be disinfected by zinc chloride, 1 to 20, or by eight ounces of milk of lime for each passage. The internal treatment consists at the beginning, or when seen in the first week, in the administration of calomel either in one dose of seven and one-half to fifteen grains, or in fractional doses of one and one-half grains every hour. Each day, morning and evening, the intestine is irrigated with a quart of boiled water saturated with boric acid, a little over one ounce, or with naphthol, three grains. Every third day a glass of purgative mineral water or half an ounce of magnesium sulphate in a glass of water is used to clear the intestine, excepting in case of peritonitis and intestinal hemorrhage. During the first four days the patient takes every hour one-third of a grain of calomel in pill-form. Every day there are administered thirty-five to seventy-five grains of benzo-naphthol, to which are added, if there be abundant diarrhœa, thirty to ninety grains of bismuth subnitrate or salicylate, either suspended or in cachets. It is important that the amount be divided into ten or twelve doses so that intestinal antisepsis may be attained. For the temperature above 102° F., but not exceeding 104 F°, the progressively cooled bath is used. At the end of the first and during the second week the patient receives, in general, eight baths in the twenty-four hours, less frequently in the third, and often they can be omitted in the first half of the day. For a rectal temperature of 104° F. a progressively cooled bath with friction is employed. If the morning remission is insignificant and the temperature remains at the point noted above, cold baths are necessary. It is also important to use the quinine hydrochloro-sulphate in daily dose of from twenty-two to thirty grains during the second, and fifteen grains during the third week. This amount should be divided into seven-grain doses administered at half-hourly intervals during the late afternoon, so that the maximum anti-thermic action may be obtained and the natural morning remission be more accentuated. In the second week we generally find the broncho-pulmonary manifestations, hyperæmia of the bases, retention of bronchial mucus. The position of the patients should be changed from dorsal to lateral and even ventral, or even to a sitting position for the ingestion of fluids. One of the advantages of hydrotherapy is the change of position which its practice necessitates. To relieve these congestions dry cupping, mustard poultices, cold compresses to the chest, frictions with hair gloves or with flannel moistened with alcohol and turpentine may be necessary. To relieve viscid expectoration drugs which liquefy and disinfect it are useful—sodium benzoate, bicarbonate or hyposulphite, or the vapor from tincture of benzoin in boiling water may be employed. If the meteorism is pronounced, charcoal, with or without iodoform, is indicated, and the abdomen may be covered with compresses wet in water, or vinegar and water may be employed. In the third week intestinal hemorrhage and the condition of the heart and skin must be borne in mind. For cardiac weakness alcohol, with coffee, or if myocarditis is present, caffeine; injections of ether should be insisted upon. If the skin becomes reddened, active prophylaxis is necessary by means of lotions of a 1 per cent. solution of chloral or dusting with talc or bismuth. When an erosion is found an air-cushion should be used and the lesion should be dressed with diachylon plaster, or with adhesive plaster sprinkled with an antiseptic powder, as equal parts of bismuth salicylate and boric acid. The treatment of women presents some peculiarities. They do not bear cold water as well as men, and one often meets drug idiosyncrasies. The cold bath may give rise to an hysteric attack, which should be differentiated from uræmia.—*Journal de Médecine et de Chirurgie Pratiques*, 1895, 5e Cahier, p. 161.

The Preventive Treatment of Fever.

Dr. Julius Weiss defines the title of his paper as the reduction of an elevated temperature of a patient suffering from remittent fever. Patients who have in the morning a normal temperature, but in the afternoon and evening show a regular recurring elevation of temperature, if antipyretics are administered in the period of normal temperature, the usual increase is either controlled or limited, or at least postponed. The cases were selected from patients suffering from phthisis, typhoid fever, and the septic processes. The drugs used were phenacetin, antipyrin, quinine, and lactophenin. The practical side of the question lies chiefly in the diminution of the hectic fever of tuberculosis.—*Wiener klinische Wochenschrift*, 1895, No. 10, S. 175.

THE ACCIDENTS OF SERUM THERAPY.

DR. PERREGAUX (*Thèse de Paris*) has collected and reported the accidents which are chargeable to antitoxin in the two hundred and forty-nine cases in which it was used at the Hôpital Trousseau. Of the local accidents, abscess was observed but once, but there were generally noted painful sensations at the site of the injection, lasting for twenty-four hours; these are avoided by strict asepsis of the field and of instruments. Of cutaneous manifestations during the treatment in hospital there were observed 33 cases: urticaria, 14; polymorphous erythema, 9; scarlatiniform erythema, 9; and purpura, 1. After the return to their homes, 57 cases: urticaria, 19; polymorphous erythema, 5; scarlatiniform erythema, 3; purpura, 1. Of the articular manifestations there were observed at the hospital 11 cases; after the return to their homes, 19 cases. Diphtheritic paralysis was noted at the hospital twice, of which one was fatal. After leaving the hospital 21 cases were found—4 of the lower limbs and the remainder of the soft palate. Persistent albuminuria was found in 6 cases. Great reserve must be observed when an opinion is to be given concerning the cases of nephritis which have been suspected. The statistics of albuminuria are hardly changed by the serum therapy. Cardiac accidents are rare; only five times were their symptoms noted before death. Of the rare accidents, anuria, fetid and persistent diarrhœa, meningeal symptoms all occurred in one case.—*Journal des Praticiens*, 1895, No. 8, p. 120.

THE TREATMENT OF CARDIAC DILATATION.

DR. DYCE DUCKWORTH presents a few points in the treatment of the gravest forms: Rest, adjusted pillows, a warm bed, and warmth to the feet are prime necessities; often these measures prove helpful after some hours of quietude. Occasional draughts of spiritus ætheris compositus are exceedingly useful, forty to one hundred minims in an ounce of peppermint or camphor water, and repeated every three hours. If there is undue lividity or turgescence of the jugular veins, bleeding, six to ten ounces, may be resorted to with relief of the urgent symptoms. If this prove to be difficult, six to ten leeches may be put upon the præcordia. Within a few days, after rest, careful dieting, a saline aperient, as mistura sennæ composita, one to one and one-half ounces, to which a drachm of tincture of jalap has been added, and occasional doses of ammonium and potassium citrate, marked improvement may be noted. It is wiser to delay for a day or two the use of digitalis, and consider that the old indication for its employment, dusky legs bloated with a soft œdema, was a good one. A feeble, irregular action of the heart, with a frequent, fluttering pulse, calls for the use of the drug. The tincture is given in doses of ten to twelve minims three or four times a day, or combined with tincture of senega and ammonia. Dropsy may be benefited by the restriction of fluids taken, the nightly use of a pill composed of mercury, digitalis, and quinine, and the occasional application of two or three leeches to the epigastrium. Alcohol in the form of brandy or gin, two or three ounces in the twenty-four hours, is useful, given in milk or water. If it is persistent, the use of Southey's trocars may be necessary, great cleanliness and antiseptic precautions being observed. The dyspnœa and sleeplessness at night may be alleviated by hypodermatic injections of morphine, one-twelfth to one-eighth of a grain. Paraldehyde may also prove of service. The bowels are here relieved by the compound jalap powder in thirty to sixty grain doses, given in a little milk early in the morning. The dietary should be nutritious and readily digestible.—*The Practitioner*, 1895, No. 321, p. 193.

THE TREATMENT OF TETANUS.

DR. MARIE reports a successful case. A milkman, aged twenty-six years, showed, after a slight injury of the foot, marked symptoms in the muscles of the face, trunk, and limbs, but, although the contractions involved the limbs, the extremities remained free in their movements. The temperature was not raised—not above 101.3° F. The progress of the disease was slow, and there were few paroxysms. Chloral was used in the daily dosage of from two and one-half to three drachms. The most interesting point to be noted is that, with the intention of rendering the alimentary canal antiseptic, a daily dose of forty-five grains of salol was given for several days, and that after the first dose the temperature, which was at the point noted above, fell to the normal, and did not again rise. It may be well, without drawing any conclusion from a single case, to note the coincidence, and inquire if this drug, which hitherto has not been used in this disease, has not some influence.—*Journal de Médecine et de Chirurgie Pratiques*, 1895, 5e Cahier, p. 169.

THE TREATMENT OF TUBERCULOSIS.

DR. R. SEIFERT places creosote in the first rank among curative measures, but states that in large doses it is no longer beneficial, it is caustic, coagulates albumin, and is poisonous. It irritates the organs of digestion and thus interferes with nutrition, so important in this disease. The taste of the drug in the mouth is very persistent. As a substitute creosote carbonate is recommended in daily doses of fifteen to forty-five minims, which on account of its insolubility can be administered in capsules. It is absorbed more slowly, and thus a continual and milder influence is kept up.—*Deutsche Medicinal Zeitung*, 1895, No. 4, S. 37.

THE TREATMENT OF LARYNGEAL TUBERCULOSIS.

DR. M. HAJEK believes that thorough cleansing is important in order to limit the action of irritating sputum. Of use are carbolic acid in from one to three per cent. solution in glycerin, balsam of Peru, creosote in inhalation, menthol in twenty per cent. solution in olive oil or glycerin, iodoform and iodol in insufflation, all being locally applied. Lactic acid also is of use, but cures very seldom result. The indications for its use are when the ulceration is quite well defined and when the general condition of the patient is good, and the greater portion of the larynx is in a healthy condition. If the tuberculous process is merely an infiltration, the application is useless. In cases where the morbid process is of small size and well defined, curetting is indicated in the hope that the process may be limited and eventually cured, as a symptomatic remedy to remove the ulcerated and infiltrated portions of the larynx, so that swallowing may be easier or to avoid suffocation. Electrolysis has but an unpromising future, the treatment is longer and more tiresome. After tracheotomy has been performed the condition of the larynx may rapidly improve, and thus, although the operation may have been one of necessity, it may become a distinctly curative one, especially in cases where the tuberculous process is rapidly advancing or the lungs are yet in good condition. By whatever method these cases are treated the dietetic and hygienic measures are of utmost importance.—*Centralblatt für die Gesammte Therapie*, 1895, ii. Heft, S. 65.

THE TREATMENT OF TUBERCULOUS ABSCESSES BY OIL OF CLOVES.

DR. ANGELO NANNOTTI published his first experiments four years ago. He makes use of eugenol, which is the most important constituent of the oil, in tuberculous synovitis and adenitis, fistulous tracts, and in pure tuberculous abscesses, employing a ten per cent. emulsion in sterilized olive or vaseline oil. In synovitis he injects fifteen to thirty minims of this emulsion every second day. The immediate effect of this injection is a burning and sometimes an inflammatory reaction, accompanied by moderate swelling of the joint, for which rest and a simple bandage suffice to relieve. When an adenitis is in the stage of induration the results were absolutely negative. When softening had taken place the same method was employed as for abscesses. For fistulous tracts the emulsion is injected in considerable quantity in order to cause it to penetrate into all diverticula. The best results were obtained with abscesses. After puncture with a tenotome and the escape of the pus the abscess-cavity was injected with the emulsion, the amount used being determined by the size of the cavity, which is by manipulation brought into contact with all parts of it, and then, mingled with the blood and *débris*, it is removed. A small quantity of the emulsion is now introduced into the abscess-cavity and left behind, and the opening closed with iodoform-collodion. After two days the abscess is again opened, the septa broken up by a sound, and the process of evacuation and injection again repeated.—*Therapeutische Wochenschrift*, 1895, No. 7, S. 127.

THE USE OF GUAIACOL.

DR. J. M. ANDERS concludes that this drug is: (1) An efficient local sedative, as shown by its analgesic power when applied in painful affections. (2) It is more potent when administered hypodermatically than when applied to the skin surface. (3) It has not, in practically afebrile conditions, produced any noticeable lowering of temperature or other unpleasant effects. (4) When employed in febrile affections it may cause objectionable effects, as rigors, followed by high temperature. (5) It seems to be powerless to control inflammatory processes, particularly when acute in character.—*Therapeutic Gazette*, 1895, No. 3, p. 145.

Dr. G. Lyon carefully reviews the literature of its external use. Sciolla noted that in the external use of this drug the amount of from one-half to two and one-half drachms was rapidly absorbed, and lowered the temperature of tuberculous and other patients suffering from pyrexias, and that this lowering was more marked if the site of the application was covered with gauze over which was laid rubber tissue. There is no doubt that the remedy is absorbed; the taste appears in the mouth about fifteen minutes after the painting, and the urine contains guaiacolo-sulphuric ether at the end of one hour, the maximum of elimination being in the course of three to six hours. Although the doses were excessive, nearly one ounce in the twenty-four hours, no accidents were recorded until Bard reported a fatal case. The temperature is generally, although not always, lowered, usually manifest an hour after the application, reaching its lowest point three hours after it, then, gradually rising, attains its former level in from five to seven hours. To avoid accidents surely, the dose indicated by Gilbert, twenty to thirty grains, should not be exceeded. An analgesic action is often immediate and marked, but sometimes lacking. If used with an equal amount of glycerin, its effect upon temperature is not marked, because its absorption is reduced to a minimum. The drug can cause severe collapse, consequent upon the sudden fall of temperature to which it gives rise, although this is fortunately rare. Profuse perspiration, chills, trembling, a rebellious, croupy cough are, however, frequent. Various local accidents have been noted: erythema with swelling and pain and even a tendency to sloughing, especially from impure drugs—*i. e.*, those contaminated with phenol.—*Gazette Hebdomadaire*, 1895, No. 8, p. 87.

The Abortive Treatment of Erysipelas.

Drs. Juhel Rénoy and Al. Bolognesi state that traumaticine is made by dissolving one part of purified gutta-percha in nine or ten of chloroform. To this is added 30 per cent. of ichthyol, the solution now appearing as a syrupy, dark-brown liquid, which, when applied with a camel's-hair brush, forms a thin film, quite flexible, but making compression after the chloroform has been evaporated. There is a transient sensation of burning produced by the chloroform. This preparation is applied around the erysipelatous area as a band about an inch wide on the healthy skin. It is claimed for this treatment that it is actually abortive—that is to say, producing a prompt and rapid diminution of the efflorescence and phenomena of general infection, in the majority of cases, namely, in 60 per cent. of the cases.—*Bulletin Général de Thérapeutique*, 1895, 8e liv., p. 155.

The Treatment of Neurasthenia.

Dr. A. Sallard states that the patient must have absolute confidence in his physician. For some patients suggestion is allowable, a positive statement that a radical cure is possible, and that at a no distant time. Hypnotic suggestion is only exceptionally rationally indicated. The prophylaxis unhappily often remains a dead-letter with the physician, but it should conside the protection of children, hereditarily nervous, from attacks of a disease to which their temperament especially predisposes them. Cerebral overwork is likely to create a cerebral neurasthenia, but voluntary work of this kind in children is rare. Muscular or genital abuse is more frequently the origin of special neurasthenia, and certain sports should be interdicted. It is prudent that marriage should be forbidden until after cure. As for hygiene, those afflicted with cerebral neurasthenia may exercise according to their habits and taste; to the spinal cases, rest is the natural remedy. Hydrotherapy is useful to the majority of cases but is not a specific. Electricity, however, and especially the static variety, is the method of choice. Isolation in grave cases often gives brilliant results. Of the therapeutic methods for the nervous depression, may be used kola, the glycero-phosphates, and quinine in small doses. The insomnia, often rebellious, may be benefited by sulphonal, or chloral, especially when combined with extract of Indian hemp. Opium is contra-indicated, and the bromides should be sparingly used lest they increase the physical and mental depression.—*Revue de Thèrapeutique*, 1895, No. 5, p. 144.

THE TREATMENT OF INOPERABLE MALIGNANT TUMORS, WITH THE TOXINS OF ERYSIPELAS AND BACILLUS PRODIGIOSUS.

DR. WILLIAM B. COLEY reports an additional series of cases; of sarcoma, three; of carcinoma, one case. He believes that the evidence at present is strongly in favor of the micro-parasitic theory of the origin of both sarcoma and carcinoma, and upon this theory believes that explanation of the action of the toxins is easy. The prodigiosus toxins used alone have a marked effect in causing degeneration and absorption of sarcomatous tissues, but the combined action of the two toxins is greater than when either is used alone.—*New York Medical Record*, 1895, vol. xlvii. p. 65.

CONTREXEVILLE.

DR. DEBOUT D'ESTREÉS states that these waters stimulate all the secretions. They increase the appetite and regulate the functions of the digestive organs, particularly in patients who suffer from the dyspeptic ailments which precede the appearance of the uric acid diathesis. They are also laxative, producing two or three liquid stools. On the circulatory system they produce a stimulation which causes a kind of inebriation which always disappears after the first meal. Upon the urinary system they act in producing considerable diuresis, the quantity of liquid voided being always greater than that which has been absorbed. They modify the mucous membrane of the urinary tract, and yield remarkable results in catarrh of the bladder, stimulating its atony. They relieve the pains of gravel in the kidneys, and they can expel the excess of uric acid from the system. The diseases which are benefited are gravel, gout, diseases of the bladder and of the prostate, diabetes, and hepatic colic. In gravel the bicarbonated and strong mineral-waters, especially those of Vichy, are to be avoided. In diabetes occurring in gouty individuals the results are good, even without any special alimentary *régime*. Dyspepsia, chronic urethritis, spermatorrhœa, and uterine catarrh may also be benefited.—*New York Medical Record*, 1895, vol. xlvii. p. 297.

Toxic Gastritis.

Dr. A. H. Pilliet has made use of rabbits in studying the effects of essence of absinthe, of tansy, of juniper, of cloves, of meadow sweet (*spirœa ulmaria*) alone, and with olive oil and chloral. The appearances found varied from slight desquamation of the epithelium to complete loss of the mucous structures down to the muscular tissues. These substances, especially the volatile oils so frequently used in bitters, possess very slight caustic properties, yet give rise to serious anatomical changes in the stomach.—*Revue de Médecine*, 1895, No. 2, p. 105.

Rectal Alimentation.

Dr. Gustav Singer states that the conditions which demand absolute rectal alimentation, with complete rest of the stomach, are hæmatemesis in gastric ulcer, dilatation of the stomach, chronic relapsing gastric ulcer, and a series of neuroses of the stomach; to wit, hyperæsthesia of the gastric mucous membrane, vomiting of the neurasthenics and hysterics, and the excessive vomiting of pregnancy. After operation upon the intestinal tract, extirpation of the pylorus, gastro-enterostomy, and resection of the small intestine, it is also indicated.—*Centralblatt für die Gesammte Therapie*, 1895, iii. Heft, S. 129.

Potassium Permanganate.

Dr. James Stratton Carpenter reports a single instance in which he successfully used this drug as an antidote to morphine. An eleven-months' infant, showing profound opium-narcosis, received an injection of five drops of the saturated solution in the outside of the thigh. An abscess followed the injection.—*Therapeutic Gazette*, 1895, No. 3, p. 162.

MEDICINE.

UNDER THE CHARGE OF

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The Excretion of Sodium Chloride in Fevers.

Von Terray (*Zeitschrift für klin. Med.*, Bd. xxvi. p. 346) has made some observations on the excretion of sodium chloride in acute fevers, which add to our knowledge of that subject. On the whole, they confirm the early work of Salkowski, but differ in some respects; and as Von Terray controlled the ingestion of the salt in his cases the investigations are to that extent more accurate. Some of the conclusions reached are as follows: In pneumonia of all kinds NaCl is retained in increasing amounts up to the height of the disease. After crisis excretion gradually increases up to the tenth day, when the normal amount is reached, and for a few days more exceeded. Corresponding to the increased amount of salt there is an increased excretion of water from the second or third day after crisis. The affected lung in croupous pneumonia contains more NaCl than the healthy one in the proportion of three to one. The amount of NaCl in the sputum and perspiration is too small to play a part in the retention. The older theories and experiments do not explain the retention of salt in fever. It is probable that the retention of water is the cause, the water holding in solution NaCl to about the proportion in physiological salt solution. In typhoid fever NaCl is retained until almost complete disappearance of fever. Here, too, there is a corresponding retention of water. In malaria the behavior of NaCl is just the opposite to that in pneumonia and typhoid. On the days with fever more salt is excreted than is ingested, whereas there is retention on the afebrile days. The excretion of phosphates is directly the contrary of this, but less water is excreted on the days of the intermission. The unusual excretion in malaria is due to the increased destruction of red blood-corpuscles, which is shown by an increased amount of urobilin in the urine and feces. During the intermission retention of NaCl favors the restitution of blood-corpuscles. The absorption of NaCl in all the cases was normal.

THE OCCURRENCE OF SULPHURETTED HYDROGEN IN DISEASES OF THE STOMACH.

BOAS gives a valuable summary of this subject, based on his large experience. (*Centralblatt für innere Medicin*, 1895, No. 3. See abstract of article by Dr. Zawadzki, AMERICAN JOURNAL OF THE MEDICAL SCIENCES, May, 1895.) He finds that H_2S occurs very frequently in the stomach-contents in cases of benign dilatation, but rarely or never in cancer of the stomach. Boas had shown in an earlier article that the production of H_2S could take place even in the presence of large proportions of hydrochloric acid, as the observations of Zawadzki demonstrate, and he goes even farther now, and holds that the production of the gas is absolutely independent of the acid, and can take place in the presence of either a large or small proportion of the latter. The kind of food has an important bearing on the production, although its precise relations are not known. There is an important antagonism between the formation of H_2S and that of lactic acid, and Boas has never found these substances present together in the same case. This fact, with some allied ones, forms a striking difference between the gastric contents in simple and in malignant retention. In the former, gaseous fermentation, with the production of hydrogen, marsh-gas, carbonic acid, nitrogen, and H_2S predominate. In the latter, gaseous fermentation is absent almost always, even in the later stages; but lactic acid, absent in benign cases, is present. In the benign cases sarcines are almost always present; in malignant cases usually absent. Finally, in malignant cases filamentous bacilli, to which too little attention has been paid, are present, though absent in the others. Cases in which carcinoma develops in the site of a simple ulcer may show apparent exceptions to these statements. The fact remains that malignant disease of the stomach with stagnation of the contents is accompanied by products of decomposition different from those in benign cases.

TUBERCULOSIS OF THE ADRENALS WITHOUT BRONZING.

COLEMAN (*Medical Record*, No. 1252, p. 552) has reported the case of a sailor, thirty-six years old, with marked constipation, who died without assignable cause three weeks after coming under observation. There was marked asthenia without apparent reason. The temperature at no time rose above 101° F. The reflexes were exaggerated and sensation was delayed. During the last few days of life delirium appeared. At the post-mortem examination the upper lobe of the right lung contained several tuberculous masses of considerable size in a state of caseation, while throughout the middle and lower lobes a few small nodules were found. The upper lobe of the left lung contained a large area of tuberculous infiltration in a state of caseation. The rest of the upper lobe was studded with miliary tubercles, while the lower contained a few tubercles along the pleura. The bronchial glands were enlarged and cheesy at the centre. The left adrenal body was somewhat distorted, and on section was found to be caseous, greenish-yellow pus exuding from several points on the cut surface. All traces of medulla and cortex had disappeared. At many points calcareous deposits had taken place in the cheesy matter. The right adrenal was reduced in size and contained one large calcareous mass, with numerous smaller ones scattered through its substance. In sections prepared from the glands tubercle-bacilli were found.

ACUTE PANCREATITIS.

At a recent meeting of the Clinical Society of London, PAUL (*Lancet*, No. 3712, p. 914) reported the case of a man, forty-three years old, who was seized with colicky pains in the abdomen, lasting for a few minutes. On the following day there was a recurrence of the pain, with vomiting. The bowels were constipated. The abdomen was slightly distended, but nothing abnormal could be detected by manipulation. The rectum was surcharged with feces. The pulse was 82 per minute and fairly full, and the temperature 100.6° F. An enema was followed by a large, constipated, but otherwise normal stool. An hour and a half later the man was found to be collapsed, with cold, clammy extremities and the radial pulse scarcely perceptible, and death took place eight hours after coming under observation, the temperature rising to 104° just before death. Two drachms of urine had been passed, containing considerable albumin, granular and hyaline casts, but no sugar. At the post-mortem examination the peritoneum covering the pancreas was found to be glued by recent lymph to the posterior surface of the stomach. The pancreas itself was much swollen and the seat of multiple hemorrhages, which were most numerous in the tail. The stomach, duodenum, and remaining organs were healthy, except for a cloudy swelling of the kidneys. There was no fat-necrosis. Microscopical examination of the pancreas disclosed considerable disintegration, with total destruction in parts of the parenchyma of the organ. Numerous hemorrhages were to be seen, as well as clumps of crystals of hematoidin.

FATAL NEPHRITIS FOLLOWING SLIGHT SKIN-WOUNDS.

SACAZE (*Revue de Médecine*, February, 1895) calls attention to the fact that, though we recognize the occurrence of nephritis in the course of the more severe infectious diseases, we are apt to overlook the fact that slight affections, in themselves of little importance, can also be followed by nephritis.

He records the case of a gardener, sixty-five years of age, who, in handling some wood, scratched his hand slightly; he neglected the wounds, and three days later, after local redness, severe chills and œdema appeared. The urine, on admission, showed 3.25 grammes of albumin to the litre. The patient gradually sank, and died with uræmic symptoms one month later, the autopsy showing a nephritis and no other important lesions. Cultures from the skin-wounds during life showed the staphylococcus albus.

From the fact that the patient had been in perfect health before the wounds were inflicted, and that there was local reaction followed by symptoms of general infection and nephritis, Sacaze concludes that the nephritis was due to infection from the skin-wounds. He concludes his paper by remarking that the staphylococci can cause an acute nephritis, and that a slight skin-wound is capable of serving as their port of entry, and can thus present this complication.

EXPLOSIVE URÆMIA DUE TO ABORTIVE RENAL CONGESTION.

FIESSINGER (*Gazette Médicale de Paris*, March 2, 1895) reports two interesting cases of uræmia, of sudden onset and short duration, occurring in two brothers. In the one, a strong, healthy man, forty-two years of age, addicted to occasional alcoholic excesses, sudden unconsciousness with convulsions came on, the only preceding symptoms having been abdominal distress the night previously. The patient had three convulsive attacks in the one morning, was up out of bed the day following, and on the third day was back at work feeling as well as ever. During the attack there was almost complete anuria, and the urine contained albumin and a trace of sugar; two days after the attack it was perfectly normal. The patient remains in perfect health six years after the observation.

The second brother, aged fifty-six years, after having headache and anorexia for forty-eight hours, was suddenly taken with orthopnœa. The patient was cyanotic and wheezy, and had a short, frequent cough, with profuse, ropy, sanguinolent expectoration. The lower portions of both lungs were full of fine subcrepitant râles. The attack occurred at night and lasted only a few hours; by the next day the patient was able to sit out of bed, and the lung signs had disappeared, and on the day following he resumed his work. The urine during the attack was slight in amount, and contained much albumin; the following day it was abundant and contained uric acid crystals and a few casts, but only a trace of albumin. In neither case were there any signs of artero-sclerosis.

Fiessenger explains these cases by a temporary congestion of the kidney, due to vasomotor influence. The congestion, he thinks, causes an œdema of the connective tissue surrounding the interlobular vessels and compresses the afferent vessels of the glomeruli, shutting off their blood-supply. The congestion may be due to a bulbar lesion or the action of unknown toxines.

The Spinal Cord in Grave Anæmia.

Burr (*University Medical Magazine*, April, 1895) reports the examination of the spinal cord in seven cases of pernicious anæmia and in one of profound anæmia secondary to chronic dysentery. In all but one of the cases of pernicious anæmia there was sclerosis of the posterior columns. The cervical swelling was the seat of the greatest damage, the lesion progressively decreasing in intensity and extent until at the lumbar region it was either absent or extremely slight. The distribution of the changes is given as follows: "The only parts of the cord ever affected are the posterior columns, the lateral columns in and near the crossed pyramidal tracts, the direct pyramidal tracts, and rarely a band running forward along the circumference of the cord (the direct cerebellar tracts). The gray matter is never affected seriously and rarely even slightly. The degeneration of the posterior peripheral roots, when present, is ordinarily so slight as to be of no importance. In the greater number of cases there is marked posterior degeneration with some, but much less marked, degeneration of the lateral columns in and around the crossed pyramidal tracts. The posterior columns may be affected alone, the lateral never alone. Almost invariably there is a band of normal white tissue separating the diseased area in the posterior columns from the gray matter. Not very rarely there are two distinct areas of degeneration in the posterior columns in the cervical region—one in the postero-internal, the other in the postero-external column, the two being separated by a band of normal or almost normal white matter. In the lower dorsal or lumbar cord the most frequent seat is midway between the posterior median longitudinal fissure or septum and the posterior gray matter. Almost always there is normal white matter between the posterior horn and the diseased area in the lateral columns. The lesion is always symmetrical in the two halves of the cord, often absolutely so, but sometimes descending farther on one side than on the other. The degeneration never produces gross deformity, alterations in the shape of the cord. There is never, for instance, shrinking in the posterior columns."

Burr regards the lesion as the effect of a toxæmia similar to the posterior degeneration occurring in pellagra and ergotism. It is remarkable how rarely the lesions are associated with any special symptoms pointing to disease of the spinal cord. The value of the paper is enhanced by a full account of the cases recorded in the literature since Lichtheim called attention to the condition in 1887.

Dr. James Taylor read a paper at the Royal Medical and Chirurgical Society on the same subject (*Lancet*, March 30, 1895), in which he reported two cases, both of which were somewhat unusual as showing symptoms during life of cord disease. In both cases extensive degeneration was found in the white matter of the cord, the gray matter being unaltered. Dr. Taylor regards the changes as due, in the first place, to sclerosis from small hemorrhages, similar to those occurring in the retina, and, secondly, to changes following upon the blood conditions, as in diabetes and pellagra.

PHYSIOLOGICAL ALBUMINURIA—SO-CALLED.

SPIEGLER (*Wiener med. Blätter*, 1894, No. 38) has examined the urine in a large number of cases with the reagent devised by him (mercuric chloride, 8 gms.; tartaric acid, 4 gms.; glycerin, 20 gms.; aq. destil., 200 gms.) for the detection of albumin. He arrives at the conclusion that albumin is a very frequent, but not a normal constituent of urine, due to certain irritations. "Anything which affects the mental or physical equilibrium may lead to the excretion of traces of albumin," for example, bodily exertion, strong emotions, even moderate consumption of alcohol. All of one hundred cases of scabies showed traces of albumin, as also cases of eczema, presumably on account of the irritation of the skin.

THE EFFECT OF ELECTRIC CURRENTS ON ANIMAL TISSUES.

ESCHLE publishes (*Virchow's Archiv*, Bd. cxxxviii. p. 385) the results of some experiments on the subject indicated in the title. The effects of strong, constant currents were first studied in dead tissues, needle electrodes being used. The changes were most marked at the cathode on account of the violent mechanical action of the liberated hydrogen. Electrolytic experiments were carried out either by passing both electrodes into the various organs, or more frequently by putting one electrode in the organ, the other, a large one, over the surface of the body. No difference could be observed in the action of the two poles. The immediate effect was a local necrosis, followed by extensive inflammatory and degenerative changes. After some days regeneration began. Some organs reacted more strongly than others, the liver showing less change, for example, than the kidneys. By applying galvanic and faradic currents to the skin evidences of inflammation and degeneration were produced in the internal organs.

EXPERIMENTAL MALARIA.

The following conclusions have been drawn from an extensive article by **DI MATTEI** (*Archiv für Hygiene*, Bd. xxii. Heft 3): Malarial infection can be brought about in men by both intravenous and subcutaneous injection. In the latter case not less than 2 c.cm. of blood should be injected. The time of incubation varies, but is usually between ten and fourteen days. Tertian, quartan, and irregular fevers are due to three different parasites, and the injection of blood containing one variety reproduces the type of the primary case, and with similar organisms in the blood. Inoculation from cases of mixed infection produces correspondingly atypical diseases. If the organisms of one type are injected into the body of a person with a fever of different type, the course of the disease may be changed.

Inoculation with the blood of a malarial man cannot reproduce the disease in a lower animal; all kinds of animals, including monkeys, having been tried. The parasites found by Danilewsky in birds, and claimed by him to be identical with human malarial protozoa, have analogies with the latter, but are essentially different from them. They cannot be grown in the human body; they do not produce similar changes; they are not affected by quinine or arsenic.

MEDICAMENTOUS LIPURIA.

SCHLOSSMANN reports the following case (*Arch. für Kinderheilkunde*, Bd. xvii. p. 251): A child, aged one and one-half years, with acute dyspepsia, was given 15 gms. each of castor oil and olive oil, with 1 drop of oil of peppermint. Urine passed about twelve hours later was scanty and turbid, the turbidity being due to oil. Twenty-four hours later the urine contained a small amount of oil; later, none at all. There was no albumin in the urine.

MIXED INFECTION IN TUBERCULOSIS OF THE LUNGS.

As the result of clinical and bacteriological investigations, **SPENGLER** (*Zeitschrift für Hygiene*, 1894, Bd. xviii. p. 343) draws the following conclusions: In only a small percentage of cases of pulmonary phthisis is there a pure tubercular disease. In such cases, if there is fever, the anatomical alterations are always more extensive than can be made out by physical examinations. If the sputum is thoroughly washed, pure cultures of tubercle bacilli can be obtained from it. The prognosis is unfavorable in such cases if there is fever, or if tuberculin is not used early. Most cases of pulmonary phthisis represent streptococcus mixed-infection. They may be divided into "active" cases, with fever, and "passive" cases, in which streptococci are present in the sputum, but there is no fever. The distinction is made by the sputum examination. Usually, in such cases, the streptococci infect the lung tissue and cause an inflammation. This produces the characteristic symptoms of phthisis, such as night-sweats, loss of appetite, etc. The severity of the symptoms depends on whether normal tissue or cicatricial tissue is affected, and on the extent of the primary and secondary diseases. Streptococci sometimes produce closed abscesses in the lungs, and from the absorption of toxic substances from these high temperatures occur. The prognosis of active secondary infection is favorable when it complicates a local tuberculosis, remains localized, and is treated early climatically. In addition to streptococci, tuberculosis of the lungs may be complicated by Fraenkel's diplococcus tetragenus, rarely staphylococci, influenza bacilli, etc. In all cases it is difficult to determine whether fever, if present, is due to the tuberculosis or the complication. In climatic treatment the mixed infection disappears frequently, while the tubercular disease remains. The principles of aseptic surgery should be followed in the prophylaxis of phthisis.

THE LOCALIZATION OF THE SECOND AORTIC AND PULMONARY SOUND.

HEITLER maintains (*Wiener klin. Wochenschrift*, 1894, No. 50) that the second aortic sound is widely transmitted, while the second pulmonary is relatively localized, but that in distinguishing the two the qualities of the two sounds are more important than the areas in which they are heard. The second aortic is clear and pure, and, as compared with the pulmonary, high. Often it is a real tone, the pitch of which can be fixed, and sharply circumscribed. The second pulmonary is less pure, deeper, not sharply circumscribed, and lasts longer. If the characteristics of the sound are determined it is not difficult to localize them.

SURGERY.

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A STUDY OF ERYSIPELAS: ITS CURATIVE INFLUENCE UPON GRANULATING SURFACES AND UPON SARCOMATOUS GROWTHS, ETC.

From a clinical study of erysipelas, **SELVA** draws the following conclusions (*New York Medical Journal*, vol. lx., No. 26):

1. The general infectious nature of erysipelas and its dangers should always be borne in mind. Marked prostration, cerebral symptoms, and septicæmia are not infrequent complications.
2. Accidental erysipelas has a curative influence upon granulating surfaces, but its use in the treatment of ulcers would be unjustifiable.
3. In the treatment of neoplasms by Dr. Coley's method of inoculation with the streptococcus of erysipelas we have a therapeutic agent which should not be employed indiscriminately.
4. There is a marked discrepancy between the clinical and pathological evidences; Dr. Coley's cases of disappearance of neoplasms under his treatment with streptococcus inoculation contrast with the results obtained by Dr. Councilman at the autopsy.
5. Further investigations, especially with the toxic products of erysipelas, are necessary for the resolution of this important problem.

ON THE CURATIVE ACTION OF INSUFFLATION OF AIR IN TUBERCULAR PERITONITIS.

FOLET, in an article on this subject (*Revue de Chirurgie*, 1894, No. 12), refers to the "happy error in diagnosis" that led Sir Spencer Wells, in 1862, to open the abdomen in a case of tuberculous peritonitis which he had thought before operation was one of ovarian cyst. The patient was cured by the laparotomy and remained well at the end of twenty-seven years. König, in 1884, was the first to recommend laparotomy as a method of treatment in tubercular peritonitis. Three hundred and fifty-eight cases have been reported in which this method has been employed. The mortality, considering the gravity of the affection, has been small. In thirty-two cases death followed the operation more or less rapidly, and fifty-one died in the course of a few months. One hundred and eighteen remained well at the end of six months, seventy-nine for more than a year, and fifty-three more than two years, while cases are recorded as having good health thirteen, fourteen, and even twenty-seven years after operation.

There are various theories concerning the cause for the improvement in these cases, but they are all speculative. The subacute or chronic ascitic form of tubercular peritonitis is the most favorable variety for this treatment. The dry and fibrino-plastic cases have not done well after operation.

Upon the theory that the presence of air in the peritoneal cavity exercised a destructive effect on the anaërobic micro-organisms, Folet inflated the abdomen with air, after withdrawing the fluid, in a case of tubercular peritonitis that refused laparotomy. The patient improved, and eight months afterward was in a very satisfactory condition. Mosetig v. Moorhof employed this treatment in the case of a child four years of age, but the air was sterilized by being passed through a solution of carbolic acid. Folet objects to this procedure, and believes that the air in its normal condition is more efficient.

A Rare Case of Divergent Luxation of Both Bones of the Forearm.

Divergent luxation of both bones of the forearm is of so rare an occurrence, as Bardenheur remarks, that authentic cases are of interest to the surgeon. **Petzholdt** (*Arch. für klin. Chir.*, 1894, Band 48, Heft 1) describes a case which is of great interest, since it is of an entirely new variety of this rare luxation. The case related consisted not only in a luxation of the ulna posteriorly and the radius anteriorly, but the radius was also slipped inward to the inner border of the trochlear, over the fossa supratrochlearis, near the coronoid process of the ulna. The luxation occurred in a child nine years old and poorly developed, after a fall upon the hand of about three feet; there was scarcely any swelling, and all the bony points could be made out easily.

The prognosis in these cases as regards pronation and supination is improved, as this case recovered both. In reducing these luxations the first attention should be given to reducing the radial luxation, and then the ulna, as the reduction of the radius is more difficult after the ulna has been replaced.

On The Treatment of Hydronephrosis and Pyonephrosis.

Cramer, writing on this subject, states (*Centralblatt für Chirurgie*, 1894, No. 47) that the cause of hydronephrosis is still in doubt, excepting those cases depending upon obstruction by a calculus. The author suggests the possibility of an inherited tendency to hydronephrotic moving kidney. Normally, the kidney scarcely has a pelvis, but the calices discharge their contents at the deepest portion into the ureter. If the ureter is fixed by any adhesion, and the kidney falls downward and forward toward the middle line, the mouth of the ureter does not represent the deepest portion of the pelves, but a little above. In this way the collection of urine in the kidney begins, and the accumulation and discharge alternate according to the position of the kidney. If the malposition continues, a kind of valve-mechanism is formed at the mouth of the ureter.

In regard to therapy, the remedy is to restore the mouth of the ureter to the lowest part of the pelvis. Nephrectomy has been recommended, but it seems unjustifiable to sacrifice such an important organ, and nephrotomy is therefore more suitable.

Two cases are reported in which the kidney was reached posteriorly through Bardenheuer's flap incision, the ureter divided and transplanted in a slit made in the lowest portion of the hydronephrosis sac, which was opened and packed. It is not possible to prove that the function of the kidney has been restored in each case.

THE CONTAGIOUSNESS OF CANCER.

At the eighth session of the Congrès Français de Chirurgie, during the discussion of the "Etiology and Pathogenesis of Cancer," **GUELLIOT**, of Reims, stated that the belief in a cancerous diathesis has prevented a more general acceptance of the infectious nature of cancer, which, beginning as a local disease, affects the economy secondarily. The experiences of Hanau and Moreau prove that cancer is inoculable in animals of the same species. Experimental hetero-inoculation being established, the spontaneous hetero-inoculation is possible, and remains for the clinic to prove. The rational proofs of the exterior origin of cancer and of the transmission of cancer are drawn from the usual seat of neoplasms, from the influence of lesions, irritation, or ulceration, and the numerous cases of accidental inoculation. The strongest evidence of this is furnished by observations in the rural districts. The unequal distribution of cancer is well known, and can be explained only by topographic, hydrographic, or other exterior causes in all the cases. On the other hand, there are veritable cancer-centres, abodes of cancer. Guelliot has collected fifteen examples, embracing fifty victims; the inference of contagiousness naturally follows. More instructive are the cases of epitheliomata occurring successively in persons accustomed to habitual cohabitation. The author has reported forty-two personal cases of this kind, which, added to those already published, give one hundred and thirteen observations; in more than forty-five of these husband and wife were affected. The interval which separates the appearance of the disease in the two persons has not exceeded two years in more than half of the cases. All these observations force upon one the idea of direct or indirect transmission of cancer, which spreads as an infectious disease. The incubation is from several months to two years, first localization, then generalization. The appreciation of this fact implies in the future the application of efficacious prophylactic measures.

During the same discussion, Mayet, of Lyons, expressed a belief in the cellular specificity. Laboratory experiments have led him to consider cancer is inoculable, not only by grafting, but also by the juice. The white rat is the most favorable animal for carrying out these studies. He has several times inoculated white rats with the juice of cancer obtained by the method of Brown-Séquard in extracting testicular extract, with positive results in one case in three; at the autopsy cancerous deposits were found in the kidneys.

THE TREATMENT OF SPINA BIFIDA

In a discussion on this subject, at the recent session of the Congrès Français de Chirurgie, M. **TÉDENAT**, of Montpellier, related his experience in the surgical treatment of spina bifida. In one case, in a child of fifteen months, death followed immediately upon puncture of the sac with a Pravaz syringe. In two cases he employed the method of Morton—puncture, followed by injection of iodo-glycerin 1 : 40. In the first patient, a girl of five months, which seemed cured, convulsions and hydrocephalus appeared at the end of two months. The other child remained cured. In two cases the author partly excised the tumor, to which the cord and nerves adhered. Both were cured, but one later developed hydrocephalus, and the other remained completely paralyzed. In a boy of seventeen years, who had an enormous tumor in the dorsal region, Tédenat excised and found a considerable hiatus at the spinous apophysis, and the dissection of the tumor was very difficult. The patient recovered.

Broca, of Paris, reported ten cases upon which he operated, seven recovered and three died from infection, two remotely and one immediately. He has not observed death from shock from the operation, and the chloroform has been well borne. The operation is immediately dangerous on account of the danger of infection. In regard to the definite results, hydrocephalus is frequently observed after apparent cure. Of seven patients cured by operation, one was subjected to another operation later, the nature of which was unknown; two became blind, and three developed hydrocephalus. One remained well at the end of a year.

In one of the hydrocephalic children, Broca drained the lateral ventricles after trephining, but the patient died in twenty-four hours. In another case, he made a puncture in the lumbar region at the seat of the cicatrix, and then compressed the cranium by diachylon bandages, without any result. After excision of the spina bifida, hydrocephalus is the rule, and in the presence of this condition the surgeon is helpless.

ON THE DIAGNOSIS OF RUPTURE OF THE INTESTINE.

BERNDT states (*Deutsche Zeitschrift für Chirurgie*, 39 B., 5 u. 6 Heft) that after a contusion of the abdomen the following conditions may be taken as indicative of rupture of the intestine:

1. The absence of liver-dulness (Moritz).
2. Frequent and uncontrollable vomiting.
3. The appearance of peritonitis, if lesions of the kidney, bladder, liver, and spleen can be excluded.
4. Spontaneous pain in the abdomen is not of itself of much diagnostic value.

Regarding the advisability of operating in these cases, the author says:

1. If there is unmistakable evidence of rupture of the intestine, immediate laparotomy is indicated.
2. Exploratory laparotomy after contusion of the abdomen is usually to be avoided; in uncertain cases, expectant treatment should be adopted (Moty).
3. If soon after the injury (twenty-four to thirty hours) there are signs of sepsis, operation is contraindicated. A low temperature with marked constitutional symptoms is an especially unfavorable condition.
4. Rapidity and delicacy are essential in operating for rupture of the intestine, especially if peritonitis is present. Therefore, a long abdominal

incision, rapid, systematic examination of the intestine, avoiding rough tearing or handling; if possible to avoid it, do not resect the intestine; employ simple Lembert sutures, or at most a wedge-shaped resection of the injured portion of intestine, and close with a simple running suture including the muscular and serous coats. Flushing the abdominal cavity with antiseptic liquids is to be avoided.

INDICATIONS FOR THE SURGICAL TREATMENT OF CHOLELITHIASIS.

Gersuny gives the following indications for operation in cholelithiasis (*Wiener medicinische Presse*, 1894, No. 47):

1. *Momentary danger* by bursting of the gall-bladder, obstruction of the intestine, beginning sepsis. If traces of sepsis are found, the necessity for operation becomes imperative. Such cases may be cured by expectant treatment, but the danger to life is greater than that incurred by the operation.

2. *Frequent attacks of colic and persistent icterus.* Marked frequency of the attacks makes one apprehensive of danger to the patient. Further, the fact of permanent irritation is not to be underrated, because it may cause carcinoma. Persistent icterus results, as a rule, in the decline of the general health, so that one is obliged to operate to improve the nutrition of the patient.

3. *Inability to work and constant pain.* Even if there were no momentary danger to demand an operation, if the suffering of the patient prevents him from doing anything, surgical interference is indicated, especially if the patient is dependent upon his own exertions.

STERILIZATION OF THE HANDS WITH MARBLE-DUST.

Wittkowski recommends (*Therapeutische Monatshefte*, Bd. viii. p. 343) for sterilization of the hands, 1 part of common soap, 3 parts of sieved marble-dust, 4 per cent. lysol, and a little wax paste. Bacteriological experiments, after using this preparation, show that it may safely replace all other disinfecting methods, and renders the use of alcohol unnecessary.

APPENDIX CALCULI.

Rochaz (*Revue Médicale de la Suisse Romande*, 1894, No. 12) concludes a valuable article on the above subject as follows:

1. Appendicitis is caused, in the great majority of cases, by stercoral calculi, even though they be not found at the operation. 2. Foreign bodies, proper, are very rare in appendicitis. 3. Worms are not found in the appendix during life. 4. In the normal appendix the fecal matter is found most frequently in a fluid state. 5. The calculi form in the appendix itself. 6. Usually they are not multiple. 7. Their general form is elongated, their color is generally brownish, their consistence is as frequently hard as soft. 8. On section, they commonly present a disposition to concentric layers. 9. The nucleus is, as a rule, of lighter color than the envelope; it is very rarely a foreign body. 10. The chemical composition of appendix calculi closely corresponds to that of human feces. 11. Men are more subject to appendicitis by foreign bodies than women, and the majority of cases are observed between

the ages of ten and thirty. 12. Constipation does not seem to have any influence on the frequency of appendicitis. 13. The position of the appendix is nearly always abnormal. 14. Often the base of the appendix has been found widened like a funnel. 15. Flexions, strictures, and adhesions are predisposing causes of appendicitis by foreign bodies. 16. Heredity plays an important *rôle*, although unexplainable, in appendicitis.

THE CURE OF SPLENIC FEVER BY ERYSIPELAS SERUM, AND SUGGESTIONS ON THE ETIOLOGICAL TREATMENT OF CARCINOMA AND OTHER MALIGNANT NEOPLASMS.

EMMERICH (*Centralblatt für Chirurgie*, 1894, No. 45) calls attention again to the fact which he had previously demonstrated, and which has been confirmed by Pawlowsky, that malignant pustule in rabbits could be cured by subcutaneous injections of the cocci of erysipelas. This result, it is claimed, is attained by chemical changes in the blood, brought about by the streptococci, which destroy the bacilli of splenic fever.

Emmerich has since succeeded in obtaining the same result by injecting erysipelas serum from which the cocci have been separated by filtration. The cure was more rapid and more certain if the serum was obtained from other animals than the rabbit, the sheep being one of the best. The number of investigations so far made is not large. The author supposes the cure is effected by a combination of a protein substance which results from the death of the streptococci in the blood and the combination of this with the albuminoid portion of the blood. He hopes that the cure will succeed also in man, in whom the disease is less violent. In tuberculosis in the rabbit this disease has been brought to a standstill, but has not been cured. Emmerich hopes that clinicians will make trials of the effect of the erysipelas serum in other diseases. One case is mentioned as having developed erysipelas from the treatment.

STERILIZATION OF CATGUT BY HEAT.

SCHÜLLER advises the following process for the sterilization of catgut (*Aerztlichen Pratiker*, 1894, No. 30): Take good, dry catgut in loose coils, place in a wide-mouthed glass vessel, cover with oil of lavender, and heat to a temperature of 110° for half an hour in a steam sterilizer. The catgut may be used directly from this oil, or from an antiseptic watery solution.

THE DISINFECTION OF KNIVES FOR OPERATIONS.

IHLE (*v. Langenbeck's Archiv*, Bd. xlviii., Heft 4) advises the boiling of knives, which he thinks has been too largely abandoned on account of their becoming dull. This he claims is frequently due to contact with other instruments or with the vessel. Ihle states that even prolonged boiling in soda solution does not destroy the edge. The soda solution must be at least of one per cent. The edge of the knives should be protected while boiling. The proper proportion of soda will be obtained by adding one tablespoonful of powdered soda or three tablespoonfuls of the crystals to a litre of water.

TRACHEOTOMY IN DIPHTHERIA.

FISCHER (*Deutsche Zeitschrift für Chirurgie*, xxxix. Band, 3 u. 4 Heft), from a study of 1000 cases of diphtheria in which tracheotomy was performed, gives the following deductions:

a. In the city of Hanover when there was no epidemic of diphtheria or scarlet fever, 41 per cent. of the children operated on were cured.

b. There were more boys operated upon than girls; the prognosis was better in the former.

c. The majority of the children operated upon were in the second and third year, the numbers being fewer with each additional year of life. On the contrary, the prospect of cure increased from the second to the eighth year.

d. Eighty-eight per cent. of the children were admitted to the hospital with signs of suffocation, so that the operation was demanded immediately or within one day.

e. In the fatal cases death occurred most frequently on the second and third days after tracheotomy.

f. The cure was generally complete in from two to four weeks after tracheotomy.

g. Laryngo-pharyngeal diphtheria was more frequent than the laryngeal form, and gave also a less favorable prognosis.

h. Diphtheria increased in the fall, and again in the winter months, decreasing again in spring and summer.

i. The average stay in the hospital of cases cured by tracheotomy was twenty-nine days.

k. Children from the village operated upon gave better results than those from the city.

l. Of the children not operated upon, (510) 67 per cent. were cured.

m. The average period of treatment needed by children with diphtheria was 12.7 days.

The total cost of 1510 children with diphtheria was 48,412 marks.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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SIMPLE ACUTE THYROIDITIS.

An excellent paper upon this subject, with an extended bibliography, was read by DR. HOLGER MYGIND before the Copenhagen Medical Society, November 6, 1894 (*Journal of Laryngology, Rhinology, and Otology*, No. 3, 1895). By simple acute thyroiditis the author means inflammation which terminates in resolution and not in abscess. It is quite a rare disease, and but few physicians have ever encountered it. References are given to fourteen published cases, and one reported by the author in this paper. Twenty-one other reports are mentioned of which the character is doubtful owing to defects or brevities in the reports. It is most frequent in females, and between the twentieth and thirtieth years of age. The oldest case on record is a woman of forty-two, and the youngest a child of three.

As immediate causes are mentioned cold and rheumatic fever. The most prominent symptom is dysphagia, which is said to be absolutely constant. This dysphagia is most frequently accompanied by odynphagia. Dyspnœa is less frequent, constant cough still more so, and hoarseness quite exceptional. The fever is not high, rarely exceeding 102.2°. The best treatment is said to be energetic topical antiphlogosis.

Exophthalmic Goitre, Acromegaly, and Glycosuria in the same Patient.

The case is described by Prof. Lancereaux (*Universal Medical Journal*, April, 1895, from *Semaine Médicale*, February 13, 1895) in a woman subject to migraine and hemorrhoids, who, at the age of thirty-seven years, coincident with the cessation of the menses, presented symptoms of exophthalmic goitre, and at the same time glycosuria, polyuria, and polydipsia. This complex of pathological conditions was attributed to the same general cause, a vasotrophic neurosis, to which Lancereaux gives the name of herpetism. This theory is said to render evident the indication of treatment directed toward the disturbance of the nervous system; potassium bromide and hydrotherapy responding best to the indication.

Foreign Bodies in the Alimentary Tract.

Landstrom reports (*Universal Medical Journal*, April, 1895, from *Hygeia*, lvii. 2) a case of a seamstress who, while performing lavage of the stomach for round ulcer, swallowed a portion of the tube, forty-eight centimetres long and eleven centimetres wide, solid and somewhat inelastic. Eight days later Landstrom detected the foreign body doubled on itself in the right iliac fossa immediately above the Poupart ligament. Laparotomy was performed by Ekehorn, and the tube was found in the ascending colon, the torn end being clearly seen through the intestinal wall. It was removed through a longitudinal incision of three centimetres. The patient recovered without incident.

[It seems not unlikely that a wait of three or four more days would have eventuated in the normal discharge of the tube from the rectum. There must have been some serious conditions which rendered the operation necessary.]

Mercurial Stomatitis or Diphtheria.

Dr. Courtin reports (*Universal Medical Journal*, April, 1895, from *Presse Med.*) a case of stomatitis and pseudomembranous tonsillitis in connection with a mercurial eruption, the result of applications of mercurial ointment to the abdomen some days after delivery. The patient recovered in forty-eight hours, just as a bacteriological diagnosis of diphtheria was sent in a the result of cultures made from the products in the throat. The reporter states that if he had made injections of the antitoxin serum in this case in view of the bacteriological examination it would have been regarded a case of cure from the use of the serum. He urges that the serum treatment, therefore, be reserved for cases clinically and bacteriologically diagnosed as diphtheria.

Herpes of the Larynx.

Dr. A. Brindel (*Rev. de Laryngologie d'Otologie, etc.*, No. 6, 1895) presents an article upon "Herpes of the Larynx." After referring to nineteen cases, three of which he had the opportunity of seeing, the author discusses the entire subject, which is illustrated by a pharyngeal and laryngeal picture in red ink, and by three cases.

According to the author, herpes of the larynx is to be regarded only as one of the localizations of herpetic fever, its most frequent seat being on the posterior surface of the epiglottis and the region of the arytenoids. It is characterized by the evolution of herpetic vesicles surrounded by an inflammatory zone. The symptoms are those of herpetic fever upon one side, and odynphagia, dysphonia, and possibly dyspnœa on the other. The invasion is sudden, the progress rapid, the prognosis good, recovery complete, and recurrence possible.

Association of Epithelioma, Tuberculosis, and Syphilis.

Mr. Percy Jakins reports (*Journal of Laryngology, Rhinology, and Otology*, No. 3, 1895) a case of pulmonary phthisis complicated with epithelioma of the pharynx in a woman thirty-three years of age. The diagnosis was established during life by microscopic examinations of a fragment of the growth, and was confirmed by the post-mortem examination, when the right lung was found to be riddled with tubercle, the left being fairly healthy. The growth extended into the œsophagus, where it produced a stricture.

Dr. Wolfenden refers to a case, reported by him in the *Transactions* of the British Laryngological Association, of early syphilis which eventually developed tubercle, and ended with epithelioma and death. In the microscopic specimen there was distinct histologic evidence of syphilis in the cells, and tuberculosis. In one section there was a tubercle with tubercle bacilli underneath an epitheliomatous tissue.

Sudden Death after Intubation of the Larynx.

This case is reported by Dr. Duran (*Universal Medical Journal*, April, 1895, from *Revista de Ciencias Medicas de Barcelona*, January 10, 1895). A girl, three years of age, was brought to the hospital, after a few days' illness, with the posterior portion of the mouth, the uvula, and the fauces, as well as the nasal fossæ, invaded by false membrane. The usual treatment producing no result, Aronson's antitoxin was administered, and, as the blood showed a deficiency by evening, intubation was performed. The child breathed better for several minutes, when the facial muscles suddenly contracted, the eyes opened widely, a slight convulsion took place, and death followed. Traction of the tongue, artificial respiration, and ether injections were tried without avail; death having been instantaneous. The autopsy did not show any lesion of the organs, and the fatal termination was attributed to a reflex originating in the larynx, the bulb responding by cardiac paralysis.

Tracheotomy under Difficulties.

In a successful operation for the removal of a bonnet-pin from the trachea, narrated by Dr. Robert Glasgow, of Lexington, Virginia (*Virginia Medical Monthly*, No. 1, 1895), the thyroid gland was found enlarged, its lobes adherent, and overlying a portion of the trachea which it was desired to incise. Venous hemorrhage from the lower angle of the wound was very copious and the bleeding points so inaccessible that they could not be secured by ligature, and had to be controlled by compression with gauze-packing. The innominate artery was so exposed that it could be grasped between the thumb and forefinger.

In view of these obstacles low operation was deemed to be impracticable, and the windpipe was entered above the isthmus. The pin, 2½ inches long, had been seen laryngoscopically, with its point pointing upward and about on a level with the fourth or fifth tracheal ring. The head of the pin, at the time of operation, was calculated to be 3¼ inches below the cricoid cartilage, or ¾ of an inch above the bifurcation.

Laryngostroboscopy.

Prof. Oertel describes (*Münch. med. Woch.*, 1895, No. 11) a new laryngostroboscopic method of examination. This is for the purpose of controlling the observation of the manner in which the vocal bands vibrate under normal and abnormal conditions. Several instruments have already been devised for this purpose, but Prof. Oertel claims that his is far superior.

A stroboscopic disk with three rows of round openings corresponding to three octaves is placed behind a laryngoscopic reflector, and is rotated by means of an electric motor. Acting as a siren, its pitch can be raised in unison with the pitch of the vocal tone under study, and as it moves a little more rapidly than the vocal band vibrates, the excursion of the latter, as viewed through the laryngoscope, can be accurately observed. An astronomic magnifying lens is placed behind the laryngoscope, giving an enlarged image eight times the size of the normal one. When necessary, a photographic apparatus can be placed behind the disk. This instrument shows that the vocal band vibrates in its entire length in producing the chest tones, while in producing the falsetto tones it is divided into two, three, or four aliquot parts separated by nodes. In both registers the rise in pitch is produced by increased longitudinal tension of the vocal bands.

It is claimed that the use of this instrument will be of great value in the differential diagnosis of certain paretic and paralytic conditions, especially in locating the terminal nerve-fibres and muscles involved.

OBSTETRICS.

UNDER THE CHARGE OF

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ASSISTED BY

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INJURIES TO THE BIRTH-CANAL DURING SYMPHYSIOTOMY, AND THEIR AVOIDANCE.

In the *Archives de Tocologie*, Nos. 2 and 3, 1895, **AUDEBERT** reviews the literature of symphysiotomy, and collects twenty cases of laceration of the vagina following symphysiotomy, twelve cases in which the vagina and urethra were injured, six cases in which the bladder sustained damage, to which he adds a case operated upon by himself. He introduced sutures in his own case, and his patient made a good recovery. The study of these cases, taken from the records of the most experienced operators in symphysiotomy, impresses one with the fact that, under some circumstances, such injury can with difficulty be avoided. Audebert advises that after the joint is opened the two halves of the bone be held in a fixed position by an instrument which he describes and illustrates. He would also separate the soft parts beneath the symphysis completely, cutting the subpubic ligaments. If the vulva and vagina are small, dilatation with a rubber bag is advised. When the forceps is used the instrument should be applied at the superior strait, if possible, traction being made downward and backward. The head should be extracted, turned obliquely, and even transversely with the long axis of the vulva. Should injury to the anterior vaginal wall and the urinary tract seem imminent, it is better to incise the perineum freely, and close such separation of tissue by sutures after delivery.

TWO CASES OF TETANY IN PREGNANT WOMEN.

NEUMANN reports, from Schauta's clinic in Vienna, two cases of tetany during pregnancy, in the *Archiv für Gynäkologie*, Band 48, Heft 3, 1895.

The first of his patients was in her eleventh pregnancy. The abdomen was considerably distended, and cramps in the patient's hands were followed by intermittent uterine contractions. The muscles of the larynx were also subject to frequent spasm, while the patient suffered considerably from painful sensations in the abdomen. The introduction of the finger within the cervical canal gave rise to spasm in various parts of the body. The patient was delivered spontaneously, and suffered during labor from frequent and severe spasms of the larynx. During the puerperal period muscular spasm disappeared, although the irritability of the nervous system was much greater than normal. The patient suffered from severe after-pains during the first few days after delivery.

Neumann's second case was in her seventh pregnancy. She suffered from a cardiac lesion in addition to tetany. After labor, uterine relaxation and hemorrhage occurred, with the retention of a large clot within the uterus. This was removed, and the uterus douched and tamponed with gauze. During the puerperal period the uterus underwent rapid involution. Nursing the child, however, would bring on spasms, and cause abnormal sensations in the abdomen and throat. Six weeks after confinement the child was weaned, when the tetany disappeared. Eight months afterward the patient was again pregnant, and the peripheral nerves were found in a condition of exaggerated sensibility.

INJURY TO THE STERNO-MASTOID MUSCLE OCCURRING DURING BIRTH.

In the *Zeitschrift für Geburtshülfe und Gynäkologie*, Band 31, Heft 2, 1895, PINCUS reviews the literature of this subject, and has collected reports of forty-three cases. He finds that this complication was early recognized by obstetric writers. Injuries to these muscles, sufficiently severe to cause evident symptoms, are relatively rare. A distinction is to be made between primary rupture of the sterno-cleido-mastoid muscle followed by inflammation, and traumatic myositis, either circumscribed or diffuse. Inflammation of the muscle is by far the more important. In establishing a diagnosis it is necessary to determine accurately the time after delivery when this injury was first noticed. Syphilis has nothing to do with causing this condition. There is no doubt that it follows traumatism. Torsion of the child's body is the most important mechanical cause, while, as accessories, are the weight of the child, traction with forceps or with the fingers, traction upon the umbilical cord when wrapped round the child and passing over the muscle. In examining a given case one must keep in mind congenital variations in these muscles, and especially shortening, sometimes seen at birth. The frailness of these tissues to injury must also be kept in mind. The Schultze method of resuscitating children has not been observed to cause injury to these muscles.

The manner in which this injury occurs is clearly understood. In the first position of a vertex presentation the muscle of the left side is most usually injured, while with the second position the muscle upon the right is exposed. In breech presentation with the first position the right muscle is often wounded, while with the second position of breech presentation the muscle of the left side is most exposed. So far as medico-legal medicine goes, injury to these muscles at birth is of no special importance in determining the presence or absence of wilful injury to the fœtus. Injury to the sterno-cleido-mastoid muscle only exceptionally causes persistent torticollis. These cases of torticollis usually develop after great stretching and wounding of the muscle.

The treatment of this complication of labor is essentially prophylactic. The obstetrician must use properly made forceps, correctly shaped. In obstetric manipulations, twisting of the child's neck or forcible torsion of the trunk must be carefully avoided. It would be well if text-books upon obstetrics insisted upon a more careful study of injuries to the fœtus occurring during labor.

RETENTION IN UTERO OF THE SKELETON OF A FŒTUS FOR FOUR YEARS.

In the *Centralblatt für Gynäkologie*, No. 9, 1895, RESNIKOW describes an extraordinary case as follows: The patient was a multigravida who had borne twins; while pregnant, she had a severe fever which lasted two months; during the first day of the disease she had labor-pains, but nothing came from the womb; some time after this there began to be a discharge of pus from the vagina, and a year afterward with the pus bits of bone escaped; this persisted at intervals for three years, and the patient became very much emaciated; she had occasional attacks of high fever, and lost flesh and strength to a very marked degree; menstruation during the four years did not return.

Upon examination no evidence of inflammation about the pelvis was found. It was very evident, however, that pieces of bone were contained within the uterine cavity. After suitable preparation, the uterus was dilated with Hegar's dilators, iodoform-gauze tampons, and laminaria tents. Sufficient dilatation was secured to permit the extraction of the skeleton of a fœtus of seven months. The uterus was thoroughly disinfected, and the patient made a good recovery. It is supposed that during pregnancy the patient suffered from typhoid infection, which caused the death of the fœtus and led to its subsequent suppuration. But few such cases are on record in the literature of the subject.

LOCAL TREATMENT OF PUERPERAL ENDOMETRITIS.

HUINERIK, of Amsterdam, reports in the *Nederl.tijdschr. v. Verlosk en Gynœcol.*, Jahrg. v. Abl. 2, 52 cases of puerperal sepsis in the Amsterdam Obstetric clinic treated by prolonged irrigation with 1 and 1½ per cent. or 2 per cent. carbolic acid solution, or 1 : 4000 bichloride of mercury solution; following this irrigation, the inner surface of the uterus was thoroughly painted with undiluted tincture of iodine. All of the cases recovered, the treatment being instituted so soon as fever developed.

MOBILITY OF THE PELVIC ARTICULATIONS AS DEMONSTRATED BY WALCHER'S POSITION.

In the *Centralblatt für Gynäkologie*, No. 10, 1895, KÜSTER, of Moscow, draws attention to an article by KORSCH (*Zeitschrift für Geburtshülfe und Gynäkologie*, 1881, No. 6, Part I.). From observations made in Slaviansky's clinic, Korsch determined that the increase in the true conjugate of the pelvis, because of the increased mobility in the pelvic joints during pregnancy, amounts to from three to ten millimetres. Other diameters of the pelvis are not proportionately enlarged. In the majority of cases the greatest mobility is found in the joints of the sacrum and coccyx. The number of previous labors has no influence upon this mobility.

Based upon these facts, Walcher's position is a simple method of taking advantage of them.

Among 4000 cases of labor, Küster had 84 in which the pelvis was contracted; 35, or 71 per cent., were delivered without assistance; version was employed in 6 cases; extraction by the breech in 4; the forceps was applied at the brim of the pelvis 17 times; craniotomy was performed 10 times; and labor was induced in 6 cases. All of the mothers who had contracted pelves recovered, while of the children 19 per cent. perished. Küster describes an interesting case which, taken with others, leads him to believe that many cases of difficult labor are caused by the lack of mobility in the pelvic joints, and not by an absolute contraction of the pelvis. He found Walcher's position most advantageous in the treatment of his cases.

The Practical Disinfection of the Hands.

In the *Monatsschrift für Geburtshülfe und Gynäkologie*, 1895, Band i., Heft 3, Ahlfeld describes his results, in the practical disinfection of the hands, with himself and his assistants. He made 122 observations, cleansing the hands by methods most commonly employed. He found that the skin upon the hands is proportionately easy to render free from germs, while the vicinity of the nails affords frequent resting-place for bacteria. He found also that much depended upon the energy and patience manifested by those who cleansed their hands. The use of alcohol he considers a valuable adjunct, as in sixty cases in which it was faithfully employed for three months the nails were found free from germs in fifty-six.

Mobility of the Pubic Joint, following Symphysiotomy, Treated by Suture through the Bones.

Binaud (*Mercredi Medical*, 1895, Nó. 14) reports the case of a woman upon whom symphysiotomy was performed in 1893. She suffered from suppuration and necrosis of the pubis, which left her with a movable pubic joint. As the patient desired an operation, the two halves of the pubis were thoroughly curetted with Volkmann's curette, and adhesions between the two bones were separated with a bistoury, when it was found that by vigorous pressure upon the sides of the pelvis the two surfaces could be brought into good apposition. There was considerable hemorrhage, which was checked by an antiseptic tampon. The periosteum and fibrous tissue were detached from the anterior surface of the pubic bones for five or six millimetres; the bones were then perforated with a fine trephine, and while pressure brought the two surfaces together they were wired in that position with silver wire. The ends of the silver wire were invaginated, and the surrounding tissues stitched over them with catgut. The skin was closed with silk, and a small drain placed at the lower extremity of the wound. A dressing of iodoform gauze and cotton was then applied. The hips were tightly bandaged, and a catheter placed in the bladder. The result was excellent, the patient being able to walk without fatigue.

The Local Treatment of Puerperal Sepsis.

In the *Practitioner*, April, 1895, Cullingworth does not rely upon the intra-uterine douche only to disinfect the womb, but would insert the first and second fingers of one hand into the uterus, while the other depresses the uterus by supra-pubic pressure. He separates any piece of adherent placenta or membranes that may be present, and completely empties the uterus with the fingers. He then thoroughly douches the uterine cavity with a hot solution of bichloride of mercury, 1 : 5000 ; temperature 112° F. to 115° F. The uterus should be carefully compressed after the douche, and the solution entirely removed from its cavity and from the vagina. Cullingworth does not use intra-uterine tamponing, and very rarely suppositories of iodoform ; his results have been very satisfactory.

THREE CASES OF CONGENITAL ELEPHANTIASIS.

MONCORVO, of Rio de Janeiro, reports in *Teratologia*, 1895, No. 2, three cases of congenital elephantiasis ; one occurred in the person of a rhachitic child, aged four months, in which the affection showed itself by enlargement of the two lower extremities ; the second case was one of hereditary syphilis, the elephantiasis manifesting itself upon the right foot ; the third was also a case of hereditary syphilis, with the lesions localized upon the lower extremities. From previous study of this subject, Moncorvo believes that the pathogenetic condition of elephantiasis may be present before the birth of the child, and that the process may reach the stage of fibrous formation. In one-third of the cases of congenital elephantiasis on record, the morbid process has remained limited to one portion of the body, especially to the limbs. In the other cases, the disease had the soft or cystic form, occasionally forming subcutaneous fibromata. Areas of vascular nævus were observed accompanying cases of the second group.

TWO CASES OF ECTOPIC GESTATION OPERATED UPON AFTER RUPTURE AT THE FOURTH MONTH.

In the *Edinburgh Medical Journal*, April, 1895, **CROOM** reports the case of a patient who presented herself with a swelling upon the left side of the abdomen extending from the pelvis to near the umbilicus. The uterus was pushed up above the symphysis, the swelling lying behind it. Upon abdominal section the sac wall was found thick and vascular, and was accordingly opened with a thermo-cautery. It was found that the sac had been opened in the site of the placenta. The cavity was emptied of blood-clot and several small masses of placental tissue ; these were subsequently found to contain villi in various stages of degeneration. No trace of fœtus or cord could be discovered. At the base of the sac was a second containing blood-clot only. The walls of the sac were stitched to the abdominal wall, and the cavity packed with gauze. Two days afterward the gauze was removed, and the cavity drained in the usual manner. Recovery ensued. The explanation of the case lies in the fact that the placenta had undergone degeneration through early disease of the villi of the chorion, and that the embryo had undoubtedly been absorbed.

Cullingsworth's second case was that of a patient with well-defined swelling extending two inches above Poupart's ligament upon the right side. The uterus was low down, softened, and had an ill-defined swelling behind it in Douglas's pouch. The patient was in collapse when admitted to the hospital. A few days later, after bearing-down pains, she expelled deciduous membrane. She was subject, however, to several attacks of hemorrhage and collapse, and the tumor grew steadily until it extended to within an inch of the umbilicus. Upon opening the abdomen, a large sac was found adherent to the peritoneum. Placental tissue and a fœtus of about four months were removed. The sac was cleared and washed out, and packed with gauze. The gauze was removed in less than two days after the operation, and a drainage-tube inserted. Between two and three days after the operation the patient died of collapse. On post-mortem it was found that hemorrhage had taken place into the bottom of the sac, and an ante-mortem clot was found in the heart.

ECLAMPSIA IN MOTHER AND CHILD.

An interesting case of this rare condition is reported from Schauta's clinic in Vienna by WOYER (*Centralblatt für Gynäkologie*, 1895, No. 13). The patient was a primipara, and was admitted to the hospital partially comatose and suffering from eclamptic convulsions. Labor was hastened by an elastic dilator, and the child delivered by version; it was asphyxiated, but was resuscitated. The mother made a gradual recovery, and left the hospital two weeks afterward. Five hours after birth the child was taken with eclampsia, accompanied by tracheal râles and impaired respiration. The pulse rose to 144. In all the child had four convulsions at intervals of an hour or two, and died cyanotic with heart-failure after the fourth. The post-mortem examination showed acute œdema of the lungs as the only lesion present. Bacteriological examination of the various organs and examination of the urine found in the child's bladder gave negative results. The few cases of infantile eclampsia on record have ended fatally.

INDUCED LABOR FOLLOWING CÆSAREAN SECTION.

In the *Centralblatt für Gynäkologie*, 1895, No. 6, SCHLAEPFER reports the case of a woman, aged twenty-seven years, with contracted pelvis, who was delivered by Cæsarean section. Several months after the operation she had marked hemorrhage at the time of menstruation, and the uterus was curetted, with the extraction of several silk sutures. She subsequently conceived, and came to the clinic at Zurich at the end of the ninth month. She was found to have a simple, flat pelvis, in which the fœtus could not be made to engage. Labor was at once induced, and dilatation completed by elastic dilators. Version was performed before the membranes were ruptured, the patient placed in Walcher's position, and delivered by extraction. The child was asphyxiated, but revived. The uterus contracted well, the scar of the Cæsarean section being plainly felt upon the anterior surface; it was not adherent to the abdominal wall. Mother and child made a good recovery.

THREE CASES OF RENAL DISEASE DURING PREGNANCY.

In the *Practitioner* for February, 1895, HERMAN, of London, considers that there are two forms of renal disease, an acute and a chronic, which affect pregnant patients. The first case was that of a multigravida, suffering from œdema, and without disease of the heart, without convulsions, and without neuritis or retinitis. Labor was induced, and a living child delivered. The patient had three rigors, followed by fever after delivery, but made a speedy recovery. The patient's urine contained an abundance of albumin, which rapidly diminished under rest, and entirely passed away after delivery. The albumin was serum-albumin. The patient made a good recovery.

The second case was that of a multigravida, who woke from sleep with severe pain in the head, and became unconscious. There was no œdema. She had double optic neuritis, and her mental condition was abnormal. Under rest and appropriate treatment her symptoms disappeared. Her pregnancy was uninterrupted.

Herman's third case is that of a primigravida, who also woke feeling very sick with headache, and with her hands clenched. She was four months advanced in pregnancy. The albumin in her urine steadily disappeared, the urine being without casts. Chronic pyelitis was found to be present, and, as this would not be benefited by the induction of labor, the pregnancy was allowed to continue without interruption.

GYNECOLOGY.

UNDER THE CHARGE OF

HENRY C. COE, M.D., M.R.C.S.,

OF NEW YORK.

THE TECHNIQUE OF TOTAL EXTIRPATION OF THE UTERUS.

MACKENRODT (*Centralblatt für Gynäkologie*, 1895, No. 6) believes that hysterectomy as a curative procedure in carcinoma of the uterus has a limited field of usefulness, and that it is only by a close study of the indications that the results can be improved. Since the object of palliative treatment is to preserve the patient's life and to relieve her sufferings as long as possible, all dangerous means to attain this end are unjustifiable. The object of the radical operation is to *cure*. Cœliotomy offers a better prospect of removing all the disease than the vaginal operation, because the surgeon is able to observe the condition of the broad ligaments and to place his sutures beyond the diseased portions. Even in cases of incipient carcinoma of the portio, combined vagino-abdominal extirpation is the more certain procedure, while the mortality in the writer's hands has been but little greater than in the vaginal.

Another important argument in favor of the abdominal method is the possibility of avoiding the danger of infecting healthy tissues by the use of the cautery.

The writer sees no advantage in the use of clamps, but thinks that in complicated cases they increase the danger of the operation. Morcellation of the cancerous uterus is objectionable, because of the risk of infection.

Total vaginal extirpation for disease of the adnexa the writer rejects, on account of Segond's mortality (12 per cent. in 118 cases), which is higher than in cœliotomy for the same condition. Moreover, the removal of the entire uterus and adnexa, when conservative treatment is possible, is opposed to the principles of scientific medicine.

The Mode of Extension of Cancer of the Uterus.

Seelig (*Inaugural Dissertation; Centralblatt für Gynäkologie*, 1895, No. 6), from a careful study of twelve uteri removed by operation, finds that cancer of the cervix extends through the chain of lymphatics accompanying the bloodvessels to the intramuscular lymph-spaces connecting the cervix and corpus uteri; hence the disease does not long remain limited to the former. It extends upward through the external muscular layer rather than along the mucosa. This extension may take place in the earliest stage of the disease when it is apparently confined to one lip of the cervix, hence a strict division into early and advanced stages is not really possible from an anatomical standpoint.

Cancer of the corpus uteri is of relatively slow growth, extending centrifugally. The lymphatics between the middle and outer muscular layers are first affected; later the cervix. The uterine wall is involved from within outward, the outer layer long remaining intact, as well as the cervical mucosa.

Renewal of the Endometrium after Curettage.

In a discussion on this subject at the Leipzig Gynecological Society (*Centralblatt für Gynäkologie*, 1895, No. 7), **Werth** presented the results of his studies of the endometrium in uteri which were extirpated at different periods after previous curettage. He found that the entire mucosa was never removed, there being patches which were untouched by the curette, while in some places the superficial layer alone was absent, and in others the muscular layer was exposed. The cornua were most likely to be spared, the anterior wall being most thoroughly scraped, especially in the neighborhood of the os internum.

The most favorable specimens for study were those in which curettage had been performed from five to ten days before. In these the entire inner surface of the uterus, with the exception of small areas in which the curette had penetrated the muscular layer, was covered with mucous membrane containing glands which opened on the free surface and a continuous layer of superficial epithelium. The young mucosa was rich in connective tissue. It is renewed principally by the aid of the bloodvessels in the submucous muscular layer, which are surrounded by bundles of fibrous tissue which sends off shoots into the superficial layer of the mucosa. The new glands are derived from the remains of those in the muscularis which are left after curettage, the surrounding stroma developing rapidly at the same time. The superficial epithelium is derived mostly from the glands, as well as by simultaneous division of the cells still remaining on the surface. The epithelium is atypical, and in the neighborhood of the gland-openings is found in several layers ten days after curettage. New epithelium is observed as early as three days after the operation.

In the later stages of the regeneration the excess of connective tissue disappears, due to hyaline degeneration, which begins in the subepithelial layer as early as five days after curettage. By the tenth day only a few bundles are seen in the superficial epithelial layer. In its place are large spindle-cells with numerous processes of protoplasm.

At the spots where the muscular layer has been injured a loss of substance has been observed as late as the seventeenth day, there being a superficial necrosis of the muscular and connective tissue, covered by a layer of fibrin. Dilated vessels surrounded by leucocytes enter the necrotic areas, which are the only spots that bear any resemblance to granulation-tissue.

DÖDERLEIN, in discussing the paper, called attention to its practical bearing on the question of the relief of uterine hemorrhage by curettage. It must be admitted that this treatment in endometritis fungosa was often unsatisfactory. It would be interesting to know how far the use of astringent injections and escharotics prevented the rapid renewal of the diseased endometrium.

WERTH, in reply to questions, stated that he used the Recamier curette, and that he had observed the same anatomical condition when no astringents were used as after the injection of the sesquichloride of iron subsequent to curettage.

ZWEIFEL disapproved strongly of injections of iron, having seen unfortunate results follow its use. He had known of two deaths from acute peritonitis, even when strict asepsis had been observed during the operation. He applied iodoform alone after curettage, which usually prevented renewal of the hypertrophied mucosa.

ENTRANCE OF IODOFORM INTO THE SUBSTANCE OF THE UTERUS.

CHROBAK (*Centralblatt für Gynäkologie*, 1895, No. 7) reports the case of a patient who died on the eighteenth day after the development of puerperal septic endometritis. Four days before her death the uterine cavity was curetted and an iodoform pencil was introduced. An examination of the uterus removed post mortem showed the presence of iodoform in the veins and lymphatics, especially in the neighborhood of the placental site, but none was found in the muscular tissue. The writer does not believe that it is possible for iodoform to be forced into the vessels by the uterine contractions alone.

ALEXANDER'S OPERATION.

KÜSTNER (*Centralblatt für Gynäkologie*, 1895, No. 7) reports thirty operations, all of which were successful, the uterus remaining permanently in its normal position. Suppuration occurred in a single instance only. The operation was performed for retroversion, never for prolapsus, the technique being as follows: The uterus being replaced, the ligaments are found and isolated in the usual manner, and are drawn out with the fingers until the peritoneal pouch appears. The first two sutures, of catgut, are then passed through the peritoneum and superficial fascia, while two or three others include the pillars of the ring and the free portions of the ligaments. The proximal ends of the latter are then excised and the external wounds are closed with tier-sutures. Drainage is not employed, but if the wounds are deep their edges are still more closely approximated by two sutures which roll in folds of skin parallel to the line of external sutures. No pessary is used, the patient is kept in bed from eight to ten days, and is discharged in three weeks at the outside, often at the end of a fortnight. The writer has never observed any marked pain or other disturbance after his operations. [It is difficult for one who has had much experience with Alexander's operation to understand how a permanent result can be expected in a case in which catgut sutures are used, when the patient is allowed to leave her bed so soon without a pessary.—H. C. C.]

THE THERAPEUTIC VALUE OF STEAM IN GYNECOLOGY.

PINCUS (*Centralblatt für Gynäkologie*, 1895, No. 11), following a suggestion of Snegirjoff's with regard to the use of steam (at a temperature of 100° C.) as a hæmostatic in metrorrhagia, has applied this agent to the treatment of other troubles. Theoretically it would seem as if this were scientific, because of the known bactericidal action of steam. The cases consisted of one of inoperable carcinoma of the corpus uteri, three of hyperplastic endometritis, and five of cervical endometritis. In only one instance were any untoward results noted, the patient having severe uterine colic. The apparatus used consisted of an inhaler, to which was soldered a curved zinc tube; over the end of the latter was slipped a piece of rubber tubing in which was inserted a Fritsch's catheter. The cervical canal being previously dilated when necessary, the water in the half-filled inhaler was brought to the boiling-point, then the lamp was removed. The catheter was then passed into the uterus and the lamp replaced. The writer found that when the instrument was inserted while the water was boiling considerable pain was produced.

In the cancer case, as soon as the steam began to escape into the uterine cavity a free discharge of blood and fragments of broken-down tissue occurred. At the end of a minute, or a minute and a half, the lamp was removed and the catheter withdrawn. The discharge now ceased and did not reappear for several days, when the steaming was repeated for the same length of time. The pain was not appreciably relieved.

The result in the cases of endometritis fungosa was quite satisfactory. In one three applications of steam were made, lasting a minute, and there had been no return of the hemorrhage after two months. Equally good results were noted in two other cases.

The writer believes that this treatment will be found especially valuable in puerperal endometritis, since the steam will not only destroy septic germs, but will cause occlusion of the mouths of lymph- and bloodvessels by favoring coagulation.

PATHOLOGY OF THE UTERINE MUCOSA.

VAN TUSSENBROEK and MENDES DE LEON (*Ibid.*) conclude an extended paper on this subject as follows: The affections of the endometrium usually described as inflammatory may be divided into endometritis and pseudo-endometritis, the former being distinguished by the presence of leucocytes which are first observed between the normal tissue elements and eventually cause their destruction. The final stage is a small-celled, fibrillated, connective tissue without glands or surface epithelium. In pseudo-endometritis there are changes in the vessels leading partly to hyperplasia of the stroma and glands, partly to atrophy and disappearance of the normal tissue-elements. Both forms are generally circumscribed. True endometritis is recognized clinically by a purulent discharge, pseudo-endometritis by hemorrhages. Corporeal endometritis is much more frequent than cervical, the latter being rare in multiparæ, and still more so in virgins. Pseudo-endometritis is more common than endometritis in the latter class of subjects; true inflammation of the uterine muscosa in these is sometimes due to a former acute infectious disease. Both varieties may co-exist especially in subinvoluted uteri where circulatory disturbances and infection are both present. Curettage is the proper treatment in both, vigorous after-treatment being necessary in order to prevent a rapid recurrence of the diseased condition. Treatment applied to the cervical mucosa alone is seldom successful.

THE NERVE TERMINATIONS IN THE OVARY.

MANDL (*Archiv für Gynäkologie*, Band xlviii., Heft 2), after describing the arrangement and mode of termination of the nerve-fibres within the ovary, draws the following inferences with regard to probable function: Since all recent observers have traced the finest fibrillæ to the follicles and to the vessels of the parenchyma, it seems probable that the majority of the nerves are distributed to the bloodvessels. Riese believes that some of the nerves, especially those ending in the capillaries, are sensory. The writer is of the opinion that the same is true of those fibres which radiate through the cortical zone and can be traced to the germinal epithelium, as well as those which run parallel to the surface of the ovary just beneath the superficial epithelium.

PÆDIATRICS.

UNDER THE CHARGE OF

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ASSISTED BY

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TREATMENT OF OXYURIS VERMICULARIS BY NAPHTHALIN.

SCHMITZ (*Jahrbuch f. Kinderheilkunde*, Bd. xxxix., 1895, Heft 2 u. 3, S. 121) reports a series of forty-six cases, in which the oxyuris vermicularis was present, treated according to the method of Ungar, by the internal administration of naphthalin. After a purge of compound licorice-powder for younger children, or castor-oil and calomel for older ones, naphthalin was administered in four daily doses for two days. Eight days after the first powder was given eight more powders were administered in the same way, and fourteen days later the dosage was again repeated. In several cases in which the results were not so satisfactory as desired, a fourth administration was made after a pause of eight to fourteen days, or after an interval was repeated once, twice, or thrice.

The dose of naphthalin varies from 2½ grains for a child one and a half years old to 6 grains for one of twelve to thirteen years, usually given in powder mixed with sugar or in capsules. Care should be taken that the drug be not given immediately after the meal, but in the intervals, and that all fatty or oily food be withheld in order to prevent solution and absorption. A purge should be given if the administration of the drug is not followed by a free evacuation of the bowels.

In twenty-six of the forty-six cases treated the results were completely successful, no return of the parasite or the various unpleasant symptoms produced by it being observed after an interval of three or four months. In the remaining cases the symptoms were amelioriated for a time, but returned, and the parasite was not completely routed. The drug was well borne by all the patients. In only one case, a child of three years, was a slight strangury noticed, and this three days after the second course of the powders, but it passed off in a short time. The author, therefore, believes that naphthalin is a safer and more efficient drug against the oxyuris than santonin or any of the other commonly used anthelmintics.

It is to be remembered that in order to test the effect of naphthalin the author did not employ in conjunction with it any form of intestinal irrigation; which is certainly an adjuvant of considerable value. Ungar uses for this purpose a solution of liquor aluminii acetici in the strength of a tablespoonful to the litre of water, believing that its astringent action aids in killing the parasite, and at the same time allays the irritation of the mucous membranes.

SUBCUTANEOUS INJECTION OF QUININE BIMURIATE IN PERTUSSIS.

Since BINZ, in 1868, first suggested the use of quinine in whooping-cough, this drug has enjoyed more or less of a vogue as a specific in this disease. Subcutaneous administration of the drug has already been tried by Drygin and Jaffé, who used the carbamide, a compound of acid hydrochlorate of quinine with urea, in solutions of two to six parts to ten of water. A much more soluble salt, the bimuriate, was suggested by Holland in his inaugural dissertation (*Ueber die Verwendbarkeit des Chin. bimur. zur subcutanen Injection*, Bonn, 1891), and advantage has been taken of this property recently by LAUBINGER (*Jahrbuch f. Kinderheilkunde*, Bd. xxxix., Heft 2 u. 3, S. 141), who reports twelve cases of whooping-cough treated exclusively by subcutaneous injection of this salt of quinine. Several solutions were employed, representing to the gramme a dose of 5, 3, or 2½ centigrammes. Injections were given as slowly as possible beneath the skin of the back, one or two, very rarely three, daily. In all the cases, except one, a decided decrease in the number of paroxysms was noted from the beginning of the injections. In this one case the number of daily paroxysms increased from twenty to twenty-five, and remained above the initial figure for six days, when a decided fall began and was maintained till cure resulted on the thirty-first day after injections were begun. In four of the cases, after the first decrease, on the fourth or fifth day an increase occurred, the paroxysms reaching a higher figure than at the beginning of the injections; but this was not long maintained, and was followed by a decided fall within a week. In these four cases, during the period of aggravation in the number of paroxysms, the severity of the kink was not influenced, but in all the other cases decided modification in the severity of the attack as well as decrease in the frequency was observed. In all the cases, however, vomiting became less frequent, appetite increased, and the general condition of the child improved.

As regards the duration of the disease after beginning injections, in only one case was this remarkably short—ten days after beginning of treatment, and about fifteen days after the onset of the convulsive stage in a case of rather moderate severity (eighteen paroxysms on the first day). In the other cases injections were required for twenty days (two), twenty-four days, twenty-eight days, thirty days, thirty-three days, and forty-five days (complicated by bronchitis). In the four remaining cases (those showing increase after the initial fall) the treatment could not be continued for various unessential reasons, and the injections were discontinued on the fifteenth to twenty-second day.

In three cases hypodermic abscesses were produced, but this was attributable to the use of a solution which had become cloudy and manifestly unfitted for use. In two cases spots of dry necrosis of the skin were produced, both in very unruly children, in whom the strongest solution, 0.5 to 1.0, was used. In the other cases no accidents followed any of the numerous injections given.

The author does not recommend this method for all cases of the disease, but believes it to be a most efficient means of administering quinine when it cannot be given in sufficient dose by the mouth; in other words, as Fervers has indicated, in those cases in which the severity of the symptoms demands prompt relief.

A House-epidemic of Purulent Meningitis.

Scherer (*Jahrbuch f. Kinderheilkunde*, Bd. xxxix., Heft 1, S. 1) gives the histories of three cases of acute purulent leptomeningitis in nurslings of a few days to a few weeks old, occurring within a short period in Schwing's Clinic in Prag. The most significant fact, however, in regard to this petty epidemic was the finding of the colon bacillus in the purulent exudates in all three cases. The fact that the bacterium coli commune is very rarely found in meningitis, and its coincidence in these three cases occurring so closely together in the same environment, lead the author to attribute the two latter cases to indirect infection from the first case, through the mouth or external ear, by means of bathing-water used in a tub in which the first child had been bathed.

Reinfection in Scarlet Fever.

Theodor Hase, of St. Petersburg (*Jahrbuch f. Kinderheilkunde*, Bd. xxxix., Heft 1, S. 58), has studied a series of 2453 cases of scarlatina with special reference to the occurrence of reinfection. Among the total number of cases studied this true *récidive* occurred in seventeen. Age seemed to play no part, the cases being observed in children from one to nine years old. The primary disease was in most cases light or moderately severe; in three only was it severe. The onset of the reinfection was marked by no special complication beyond the rise in temperature, except in three cases: (*a*) In a child of one year and two months, catarrhal pneumonia; (*b*) acute enteritis in a child one and a half years old; and (*c*) in a child three years old, who had had an intercurrent attack of measles, the scarlatina reinfection proved fatal.

The primary eruption in twelve cases was moderately marked, and in five intense. The secondary exanthem was always less intense than the primary, lasted two to eight days (more frequently two days only), and subsided more rapidly than the first. The elevation of temperature was sometimes higher, sometimes lower than in the primary attack. Renal disease occurred in eight of the cases. The so-called *pseudo-récidive* occurred usually at the end of the first or middle of the second week; the true reinfection much later, in the third to the sixth week. In none of the cases did vomiting mark the onset of the reinfection.

The Milk-supply of New York City.

Emily Lewi (*New York Medical Journal*, February 9, 1895) reports the results of an investigation carried out by Dr. Koplik and herself for the purpose of discovering the real facts concerning the condition and quality of the milk-supply of the tenement-house districts of New York City. It may be reasonably assumed that what can be proven in this investigation in New York City may be accepted without much hesitation for other large cities of the Northern States.

The investigation extended over a period from March to October of the year 1894. It having been proved that milk taken from various sources in the city and at various periods of the year possessed much the same physical characteristics, or, in other words, was an average mixed milk, the question of freshness and quality alone remained for investigation. For this purpose Soxhlet's method, as perfected by Plauth, was chosen. Soxhlet has shown that fresh milk for some time after milking does not increase in acidity, and this interim of stationary acidity is known as the incubation period, the length of which depends upon the temperature at which the milk is kept and the cleanliness attending its procural and preservation. According to Plauth, fresh milk kept at a temperature of 25° C. in the thermostat shows an appreciable increase in acidity at the end of the fifth hour, when the bacterial count is somewhat over half a million, and at the end of eight hours, when the incubation period is well over, the bacteria number eight millions.

In each case the samples of milk were kept at the temperature of the atmosphere, no effort being made to retard the incubation period by refrigeration.

The conclusions of this study indicate that both in winter and summer the ordinary commercial milk, upon its arrival in the city, is within the incubation period; that this stage lasts twenty-four hours in winter, thirteen to seventeen on a fairly cold day, and five hours on a hot summer day after reaching the city. The author, therefore, believes that if prepared (sterilized) early in the day, the ordinary milk of commerce is suitable for infant-feeding.

Further experiments were made to test the value of pasteurization as a preservative process. On a warm summer day pasteurized milk had a fairly stationary acidity for ten or twelve hours, the acidity then rising slowly until at the end of twenty-four hours the milk was curdled. The growth of the bacterium lactis was thus retarded about six hours as compared with unpasteurized milk. On the other hand, sterilization at 90° to 92° C. for forty minutes, while rendering the milk far from absolutely sterile, rendered the bacterium lactis inert for two days at least at a summer temperature. It may therefore be concluded that, without subsequent refrigeration, pasteurization in summer does not offer a safe method of preparing milk for infant-feeding. This agrees with the earlier observations of Bitter and the recently expressed view of Flügge (*Zeitschrift f. Hygiene*, 1894, S. 272) that milk pasteurized at the dairy must, upon reaching the city, be treated as unpasteurized, as far as its adaptation to infant-feeding is concerned.

A Theory of Rhachitis.

Wachsmuth (*Jahrbuch f. Kinderheilkunde*, Bd. xxxix., Hft. 1, S. 56) concludes an elaborate paper on the theory of rhachitis by stating that the conditions for the precipitation of lime-salts in normal growing bone are: (*a*) the presence of fully developed cartilage cells, and (*b*) the presence of carbon dioxide in the tissue of the cartilage and bone in quantity not sufficient to hold the lime-salts in solution, or to redissolve them when precipitated. In rhachitis both of these conditions are incompletely fulfilled and in inverse proportion to the gravity of the disease, there being an abnormal development of the small-cell elements of the cartilage with scarcity of the fully developed cells, while at the same time the free carbon dioxide of the blood is increased. In other words, rhachitis is a chronic carbon dioxide poisoning—an asphyxia of growing bone.

Further Favorable Testimony for the Diphtheria-antitoxin.

Schröder (*Münch. med. Wochenschr.*, April 4 and 9, 1895) thinks that it is too soon to pass final judgment upon the value of the serum-therapy in diphtheria. His own experience has been quite favorable. In the city hospital of Altona, from September, 1894, to March 1, 1895, he injected 63 cases of diphtheria, 8 of which died (12.69 per cent. mortality). The Klebs-Loeffler bacillus was found to be present in all but 7 cases, the diagnosis in the latter being clinical. Two of these died, so that, excluding all 7, the mortality of the true diphtheria cases was 10.71 per cent., as opposed to 29.41 per cent. for 1889, the lowest of the seven preceding years.

In 31 of the 63 cases tracheotomy was done, with a mortality of 3, or 9.67 per cent. These 3 were under two years of age, and in 1 no bacilli were found. Excluding this 1 and 1 recovery where there were no bacilli, the mortality of the tracheotomies was 6.55 per cent.

The prognosis, based on the usual clinical manifestations, was fixed as good in 15, doubtful in 20, and grave in 28 cases. Involvement of the larynx did not occur in any case after the injection.

Belwing's serum was injected in all of the cases, solution No. 2 (1000 units) being used for the most part. A sudden fall of temperature was rarely observed. The average duration of membrane after the injection was 4.9 days; the shortest being 2, the longest 10 days. In the tracheotomies the tube was worn, on an average, 6.4 days, as contrasted with 10.7 days for the same period of the preceding year.

The local treatment consisted in the application of carbolic acid and glycerin, equal parts, where the membrane was thick. In other cases a solution of chlorinated lime was used as a gargle.

In 44 cases, 69.8 per cent., albuminuria was present, 6 cases alone showing a true nephritis. In the corresponding period of the preceding year 58 per cent. of cases showed albuminuria; the increase being possibly due to more careful study, as all cases were counted where even a trace of albumin was found.

Erythema multiforme was observed in 2 cases, and an urticaria in 5, usually seven or eight days after the injection.

Three of the fatal cases showed more extensive fatty degeneration of the heart than is usual in diphtheria, and in several convalescents cardiac symptoms arose. Whether these were due to, or in spite of, the serum cannot yet be said, but it is possible that the serum may in some cases have an injurious action on the heart-muscle.

Profuse sweating was noticed after some of the injections. Paralysis followed about as frequently as formerly. A relapse has not been observed in any case. One of the cases, four weeks before the attack of diphtheria, had scarlet fever with angina, and received then an injection of No. 2, although the Klebs-Loeffler bacillus was not found. If there had been any immunization from this injection, it had certainly disappeared in four weeks.

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THE OPERATIVE TREATMENT OF HERNIA IN CHILDREN, WITH A REPORT OF ONE HUNDRED AND THIRTY-THREE CASES.

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I began operating upon hernia in children in December, 1891, just three years ago. Since that time I have performed the operation for radical cure in 133 cases under fourteen years of age. An analysis of these cases, the methods employed, and the results obtained, may be of help in determining the question as to the justifiability and value of operative procedures.

We all know in a general way that, until the more recent methods of Macewen, Championnière, Bassini, and Halsted, the results were failures in so large a proportion of cases that all operations came to be looked upon with distrust by the profession at large. That distrust has by no means disappeared, even yet, and if we can show that it rests rather upon tradition than upon facts as they exist at present, it is our duty to do all in our power to dispel it.

Before taking up the subject of the operative treatment of hernia in children it is necessary to refer briefly to the results of mechanical treatment. Some surgeons high in authority have made the statement that all cases of hernia in children can be cured by trusses. Such statements as this, though undoubtedly made in good faith, show that their authors have not carefully followed up any very large number of cases. Our knowledge of the value and limitations of the mechanical treatment of hernia has been greatly increased by the recent publication of Macready's *Treatise on Ruptures.* It is by far the ablest and most scientific work on hernia yet published, and its conclusions are based on the records of the London Truss Society, the largest hernia clinic in the world.

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[1] Read before the College of Physicians of Philadelphia, December 15, 1894.

As to the question of cure from mechanical treatment in children, Macready says, "We can only speak of probabilities; it may be said that many boys are cured, but then the prospect is more favorable for girls; that the younger the patient the more probable the cure; those with femoral hernia there is little chance of being able to dispense with a truss, and that after thirty years of age cure is not to be expected in either sex or in either kind of hernia." The London Truss Society records show 33 per cent. of children ruptured go beyond the age of eleven years uncured, and the real number Macready considers much larger.

The records of the Hospital for Ruptured and Crippled bear out these statements. Having established this point, that certain cases in children do need other than mechanical treatment, it remains to determine whether or not these cases can be cured by operation, without subjecting them to any considerable risk.

In an earlier paper on the "Operative Treatment of Hernia in Children" (*Medical Record*, July 1, 1893) I stated as my belief "that operations for the cure of hernia should stand or fall according as they fulfilled two conditions of all operations (except emergency): first a mortality either *nil* or not greater than that associated with the condition prior to operation; second, a reasonable hope of success either as regards cure or relief." The older and less perfect methods failed to fulfil both of these conditions, but the same cannot be said of the methods that we employ to-day.

In no department of surgery is there need of wider experience and sounder judgment than in the management of hernia. The indications and contra-indications for operation should be thoroughly understood and carefully considered in every case. The indications for operation in children, as they appear to me, have already been outlined (*loc. cit.*) as follows:

1. Cases of adherent omentum (rare in children).
2. Cases complicated with reducible hydrocele.
3. Cases irreducible or strangulated.
4. Cases unable to obtain the care requisite to successful mechanical treatment.
5. Cases where mechanical treatment has been faithfully tried for a number of years without benefit.

The large majority of the cases that I have operated upon have belonged to the last two classes, although the other three have all been represented by a considerable number of cases.

Methods Employed. Of the total 133 cases, 5 were femoral, 4 umbilical and ventral, and the remaining 124 inguinal. (10 females and 114 males.)

Methods of Operation and Technique. 1. Ligation of the sac and suture of the canal, without transplanting the cord, were the method employed in ten cases. The immediate and final results were as follows:

(*a*) *Catgut.* In two cases the buried sutures were of simple non-chromicised catgut: of these, one relapsed in four months, although a truss was worn after operation; the second case is well three years after operation.

(*b*) *Silk.* In one case silk was used for the buried sutures. This case healed primarily, but soon after leaving the hospital two small sinuses appeared in the cicatrix and refused to heal until the silk suture had been extruded. Relapse occurred in three months in spite of the constant support of a truss.

(*c*) *Chromicised catgut.* This was used for buried sutures in four cases: of these, two are perfectly sound two years and nine months after operation; a third, two years and ten months; and a fourth, two years and eleven months.

(*d*) *Kangaroo-tendon* was employed in three cases: of these, one is well, without recurrence, two years and five months after operation; a second, eight months; and the third was not traced.

All of these ten cases healed primarily. Of the nine cases traced, seven are well without recurrence at present, and of these, six have gone nearly three years. The two relapses were due, one to the use of catgut, and the other to silk, the objections to which will be dealt with later.

2. Bassini's method, with the substitution of kangaroo-tendon for silk in the buried sutures, was employed in *one hundred and fourteen* cases. The tendon-sutures were actually employed in but one hundred and twelve cases, silk having been used in one case and chromicised catgut in one. The silk sutures were used in my first Bassini operation done in children. The wound suppurated very badly, the sutures sloughed out, and relapse followed, as a natural result, three months later.

The case in which chromicised catgut was used was a recent case, and the catgut was used because I had no tendon at hand. Primary union occurred, but three weeks after the operation two small sinuses appeared, and I do not expect them to close until the sutures are either thrown off or absorbed.

Having now eliminated these twelve cases in which there was more or less variation in technique, we have left one hundred and twelve cases not only operated upon by a single method, but in which the same technique was observed in every detail. It is only by an analysis of cases operated upon under similar conditions that conclusions of value can be drawn.

Although Bassini's elaborate paper, describing in detail his operation and reporting two hundred and sixty-two cases, was published four years ago (*Archiv f. klin. Chir.*, 1890), there have been so few accurate descriptions of the operation in English that the technique is not generally understood, and I may be pardoned for briefly outlining its essential features:

1. The *external incision* begins at a point nearly or quite on a level with the anterior superior spine, continues obliquely downward parallel with and about one-half an inch internal to Poupart's ligament, and ends at the centre of the external ring.

2. The incision is rapidly carried down until the aponeurosis of the external oblique is freely exposed for a distance of two and one-half to three inches; a director is then passed through the external ring just beneath the aponeurosis, and the aponeurosis is divided well above, *e. g*:, one half to one inch above the internal ring.

3. The cut edges of the aponeurosis are held up with forceps and dissected free from the underlying muscles as far as the edge of the rectus internally and externally until the shelving portion of Poupart's ligament has been clearly exposed.

4. The sac and cord are then isolated *en masse*, and this is best accomplished with the fingers and blunt-pointed curved scissors. If the peritoneal layer of the sac is first reached, the dissection is easy, rapid, and bloodless.

5. The cord and vessels of cord are now separated from the sac, and this, too, is best done with the fingers. The separation is carried high up within the internal ring, and the sac is ligated or sutured at the place where it merges into the general peritoneal cavity.

6. The cord is held up and the edges of the aponeurosis rolled back, while from three to five buried sutures are introduced beneath the cord. These are best introduced from within outward, and should include the internal oblique and transversalis muscles, the transversalis fascia (and sometimes the edge of the rectus) on the inner side, and the deep shelving portion of Poupart's ligament on the outer side. The lowermost suture should embrace the conjoined tendon.

7. The cord is now replaced and the cut aponeurosis is closed over it by means of a continuous suture extending as near the pubis as possible without causing undue constriction of the cord.

8. Closing the skin-wound with interrupted sutures without drainage completes the operation.

Although this may sound like a somewhat complicated operation, and in fact it has been objected to for this reason by many surgeons, in actual practice it is simple and can be quickly performed. I have done the entire operation in fifteen minutes, and in one day I performed five operations upon four subjects in two hours and ten minutes.

I have endeavored to follow the technique laid down by Bassini as carefully as possible with the single, and, as I believe, important modification of substituting kangaroo-tendon for silk in the buried sutures.

The character of the *suture-material* I believe to be one of the most important factors in the success of any operation for the radical cure of hernia, and I do not think sufficient credit has been accorded Dr. H. O. Marcy for having demonstrated the great value of kangaroo-tendon in such operations. The tendon has been employed for many years at St. George's Hospital, London, and almost exclusively in ligating large vessels.[1] Its non-irritating properties and the time required for absorption—two to three months—have been experimentally demonstrated by Ballance and Edmunds, and I believe that an analysis of the cases presented to-night alone would be sufficient to establish its superiority to other suture-material for hernia operations. During the past three and a half years I have used kangaroo-tendon for all buried sutures in one hundred and eighty hernia operations; of these, one hundred and seventy-four healed by primary union, and the only relapse that has occurred was in a case of large congenital hernia of the umbilical cord in a child aged three years.

Silk, silkworm-gut, and silver wire have been in turn much lauded by noted surgeons as ideal suture-material for hernia operations. Their profound belief in asepsis as the embodiment of all the requisites of surgery has led them to think that the human body will rebel against nothing but germs: no matter how aseptic silk or silver wire may be, they are foreign bodies, and when placed near the surface of the body, particularly in a locality subjected to such constant motion as the inguinal canal, there is an effort on the part of Nature to rid herself of them. I am not dilating upon theoretical objections. I have seen sluggish discharging sinuses at the site of the incision many months after the operation for inguinal hernia where silk had been used, and in one case the patient remained practically an invalid nearly a year on account of this condition. Such instances are not rare, and, what is more, the ones I have observed occurred in the hands of men whose aseptic technique is as nearly perfect as any with which I am familiar.

Unless there are some advantages to be gained by using a non-absorbable suture, I see no reason why we should incur the risks of such results as I have mentioned.

In view of the many loose and contradictory statements as to the value of operations for the cure of hernia, there is nothing that will conduce more to settling this question upon scientific lines than to establish some definite period of time beyond which the hernia may be reasonably considered cured. Various periods have been given, but all of these have been based on impressions of surgeons derived from a limited number of cases. The limits more frequently given are three years or two years.

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[1] Brit. Med. Journ., November 15, 1890, p. 1110.

To ascertain whether these limits were in harmony with the facts, I have made a careful analysis of 250 cases of relapsed hernia observed and carefully recorded at the Hospital for Ruptured and Crippled during the past five years. These cases represent nearly all the operations in vogue during this time, and the large majority were operated upon by leading surgeons of New York and Brooklyn. One hundred and seventy-one operations were for non strangulated hernia, and seventy-nine for strangulated hernia.

These cases I have analyzed with reference to the time when relapse occurred, with the following results: Of the non-strangulated, 120 cases, or 70 per cent., relapsed one to six months; 27 cases, or 15.8 per cent., six to twelve months; 84.8 per cent. first year; 14.2 per cent. after first year; 5.8 per cent. one to two years; 8.4 per cent. two years.

Strangulated, 79 cases, 64.5 per cent. relapsed one to six months; 20 per cent., six to twelve months; 84.8 per cent., first year; 5.4 per cent., one to two years; 9.8 per cent., one to two years.

Some surgeons use ordinary non-chromicised catgut for the buried sutures, and even go so far as to state that the sooner the sutures are absorbed the better. As I have pointed out in a previous paper, the tissues to be united in closing the hernial canal are largely tendinous in structure, and the elaborate experiments of Busse[1] show that perfect tendinous union does not occur under ten weeks, or just about the period required for absorption in kangaroo-tendons. No better practical demonstration of the failure of catgut to meet the requirements of a suture in hernia operations could be had than the results in 19 cases of hernia in children, operated upon at the Hospital for Ruptured and Crippled in 1889–90, in which catgut was used. Of these 19 cases operated upon by suture of canal in part, and in part suture of external ring, 10 cases relapsed; 7 of these relapses occurred within three months after operation; 5 other cases were not traced, and only 2 were known to be sound three years after operation.

Having described the methods employed, let us analyze the cases now in detail.

Of the 112 cases operated upon by the Bassini method with kangaroo-tendon for the buried suture, primary union occurred in 109, or 97 per cent. In only one case was the suppuration more than slight and superficial, and that was only down to the aponeurosis. This case is now perfectly sound, one and one-half years after operation.

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[1] Deut. Zeit. f. Chir., 1891–92, xxxi.

The percentage of cases followed by immediate healing of wound without suppuration obtained by the leading operators is stated by Sir William MacCormac[1] as follows: MacCormac, 80 per cent.; Kocher, 89 per cent.; Billroth, 39 per cent.; Schede, 35 per cent.; Macewen, 86.7 per cent.; Ball, 81.8 per cent.; McBurney, 81.6 per cent.; Halsted, 82 per cent.; Kuster, 79 per cent.

Final results. All but two of the cases of Bassini have been traced. Of these, 4 have gone without truss and without relapse two and one-half to three years; 10, two to two and one-half years; 18, one and one-half to two years; 17, one to one and one-half years; 20, six months to one year; 45 less than six months; 49 cases have gone more than one year.

Mortality. There has been but one death, caused by double pneumonia, in a child of five years. It was undoubtedly due to the effect of the ether, etc. The child had had measles five weeks before, and took the anæsthesia very badly. An autopsy showed double pneumonia, with no abdominal complications and no trouble in the wound. Death occurred on the fifth day.

Femoral hernia; five cases. The method employed was high ligation of the sac and suture of the crural opening with buried kangagroo-tendon. No relapse has occurred, and all the cases have been traced: 1 is well two years and eight months after operation; 1 is well twenty months after operation; 1 is well eighteen months after operation; the other two are recent cases.

Umbilical and ventral; four cases. These have all been operated upon during the past year, and are sound with one exception—a congenital hernia of the cord in a girl of three years. A slight recurrence took place in this case within three weeks after the operation, due to a severe bronchitis.

The method employed was excision of the umbilicus and sac, suture in three layers, with kangaroo-tendon for the buried suture.

Strangulated hernia. This condition has always been regarded by surgeons as too rare to be considered, many of the most noted surgeons having never seen a case.

Tariel, of Paris, has recently contributed a valuable paper on this subject, and has collected all of the cases thus far reported in surgical literature. He was able to find 128 cases under two years of age, with 74 recoveries.

I have operated upon 6 cases: 1 aged eight weeks, 1 aged eight months, 1 aged twelve months, 1 aged seven and one-half months, 1 aged five months, and 1 aged twenty-three months. All except one recovered, and that was practically moribund at the time of operation. Simple herniotomy was performed without attempting radical cure.

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[1] Bradshaw Lecture, 1893.

Cæcal hernia. In eight cases the cæcum or appendix vermiformis formed the contents of the sac. In two cases the appendix alone was found, and in both these the tip of the appendix was firmly adherent to the bottom of the sac. The adhesions were separated and the appendix returned to the abdominal cavity. These two cases, as well as a considerable number where the mesenteric attachment of the bowel extends low down into the sac, emphasize the importance of opening the sac in *all cases* before ligation or suture.

Dr. W. L. Rodman, of Louisville, has recently reported a case where a sac which, as far as could be detected by careful examination, appeared perfectly empty, on ligation showed a severed appendix in the lower end.

In two of the strangulated cases the appendix and cæcum together were found. In one case the color of the appendix was so dark that I thought it more prudent to remove it. Recovery followed.

The other case was the child eight weeks old, nearly moribund at time of operation. Simple relief of strangulation was all that was warranted, and death occurred two days later. In a non-strangulated case of appendix hernia, the appendix if adherent can be readily freed and reduced; and I do not believe it to be the best surgery to attempt removal. I cannot but believe it adds something to the danger of the operation; and unless the success of the operation can be shown to be materially dependent upon its removal, I do not think it indicated.

Dressings and after-treatment. In all of the cases the dressings were moist iodoform and bichloride gauze, held firmly in place by rubber-plaster, over which cotton and a muslin-spica were applied. The scrotum was always left exposed. Fixation was secured by means of a plaster-of-Paris spica extending from the edge of the ribs to the ankle. This was kept on until the first dressing, or about the eighth day. The skin-sutures are entirely of fine catgut, which is usually found to have been entirely absorbed by the first dressing. None of the cases, with the exception of two or three of the early cases operated upon by suture of the canal with catgut, have worn trusses since the operation, and I do not believe a truss should be advised.

Of the 112 cases operated upon by the Bassini method, with kangaroo-tendon for the buried sutures, not a single relapse has occurred and not a single case has worn a truss.

The following table will give the more important points of the cases in detail:

No.	Age	Sex.	Nature of hernia and duration.	Operation.	Operator.	Primary result.	Final result.
1	8	M.	Right inguinal, congenital, complicated with hydrocele of cord.	Dec. 12, 1891	Czerny. Catgut-ligature; no drain.	Primary union.	Relapse 4 months after oper'n.
2	13	M.	Right inguinal, very large; 3 years' duration.	Dec. 28, 1891	Bassini. Silk for buried suture; no drain.	Very profuse suppuration and sloughing of tissues.	Relapse in 4 months.
3	6	M.	Left inguinal, congenital.	Jan 25, 1892	Czerny. Catgut-sutures; no drain.	Primary union.	Sound Dec. 1894
4	9	M.	Right inguinal; 4 years' duration.	Jan. 1892	Czerny. Silk-sutures; no drain.	Prim. union; sinus form'd after leaving hospital; sutures came out.	Relapse in 3 months.
5	13	M.	Left inguinal; 2 years.	Mar.15, 1892	Czerny. Chromicised catgut; no drain.	Primary union.	Perfect; sound Oct. 20, 1894; no truss.
6	10	M.	Left inguinal, congenital.	Feb. 15, 1892	Czerny. Chromicised catgut; no drain.	Primary union.	Perfect Oct. 1, 1894
7	7	M.	Right inguinal.	Mar.30, 1892	Bassini. Kangaroo-tendon for buried sutures; catgut for skin.	Primary union.	Firm Feb. 1894
8–9	7½	M	Double inguinal; very large.	April 8, 1892	High ligation of sac and closure of canal with buried sutures of chromicised catgut; no drain.	Primary union, both sides.	Solid Oct. 1894
10–11	7	M.	Right femoral, left inguinal; left 3 years, right 6 months.	Apr. 28, 1892	High ligation of sac; suture canal with kangaroo-tendon; purse-string suture femoral canal.	Primary union, both sides	Perfect Oct. 1894
12	13	M.	Right inguinal; 11 years' duration; truss 7 yrs.	May 5, 1892	Bassini. Kangaroo-tendon for buried suture; no drainage.	Primary union.	Perfect Oct. 1894
13	7½	M.	Right inguinal, size of egg; one suture adherent.	June 6, 1894	Bassini Kangaroo-tendon for buried suture; catgut for skin; no drain; omentum ligated.	Primary union.	Perfect Oct. 1894
14	4½	M.	Right inguinal, congenital.	June, 1892	Bassini. Kangaroo-tendon for buried suture; catgut for skin; no drain; omentum ligated.	Primary union.	Perfect Oct.3, 1894
15	8 mos	M.	Right inguinal, 1 week; strangulated, 24 hours.	July 9, 1892	Canal closed with buried kangaroo-sutures; cord not transplanted.	Primary union; one week in hospital.	Oct. 3, 1894 perfectly sound; no truss worn.
16	14	M.	Left inguinal, congenital; size of egg.	July 26, 1892	Bassini's method: lower part of sac sutured over testis; kangaroo-tendon for buried suture.	Primary union; no truss.	Perfect Dec. 1894; no truss.
17	10	M	Right inguinal, very large, congenital; complicated with hydrocele; reducible.	July 26, 1892	Bassini. Kangaroo-tendon for buried suture; no drain.	Primary union.	Sound Oct. 1894; no truss.
18	14	M.	Left inguinal; not held by truss; 1 year's duration.	Aug.23, 1892	Bassini. Kangaroo-tendon for buried suture.	Primary union; two weeks in bed.	Sep.29,1894, perfect; no truss.
19	12	M.	Left inguinal, congenital.	Aug.23, 1892	Bassini. Kangaroo-tendon for buried suture.	Primary union 2½ weeks	Feb.24,1894, sound; no truss.
20	4	M	Right inguinal, cæcal, congenital.	Sept.13, 1892	Canal sutured; cord not transplanted, kangaroo tendon for suture; no drain.	Primary union.	Not traced.
21	11	M.	Right inguinal; several years; not held by truss.	Sept. 9, 1892	Bassini. Kangaroo-tendon; no drain.	Primary union.	Oct. 1, 1894, perfect; no truss.
22	9½	M.	Right inguinal.	Oct. 5, 1892	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Oct. 1, 1894

No.	Age	Sex.	Nature of hernia and duration.	Operation.	Operator.	Primary result.	Final result.
23	14	M.	Left inguinal, congenital; relapse after supposed cure from truss.	Oct. 29, 1892	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Dec. 1894; no truss.
24	12	M.	Left inguinal, very large, congenital.	Nov 1, 1892	Bassini. Kangaroo-tendon; no drain.	Primary union.	Feb. 1894, firm; no truss.
25	4	M	Right inguinal, congenital.	Nov 4, 1892	Bassini. Kangaroo-tendon; no drain.	Primary union.	Well Feb. 1894; no truss.
26	11	M.	Right inguinal.	Nov. 29, 1892	Bassini. Kangaroo-tendon; no drain.	Primary union.	Well Oct. 12, 1894
27	4	M.	Right inguinal; cæcal; (spine disease).	Jan. 6, 1893	Bassini. Kangaroo-tendon; no drain.	Primary union.	Sound Dec. 1894
28	4	M.	Case No. 27; left side.	Jan. 6, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Sound Dec. 1894
29	6	M.	Left inguinal, complicated with reducible hydrocele.	Jan. 20, 1893	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Sept. 1894
30	9	M.	Left inguinal; 4 years; no improvement with truss.	Jan. 1893	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Nov. 17, 1894
31	14	M.	Left inguinal.	Feb. 1893	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Dec. 15, 1894
32	7	M.	Left inguinal.	Feb. 1893	Bassini. Kangaroo-tendon; no drain.	Primary union	Perfect Feb. 1894
33	14	M.	Right inguinal, complicated with undescended testis.	Mar. 10, 1893	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Sept 29, 1894
34	10	F.	Right inguinal.	Mar. 10, 1893	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Dec. 1894
35	10	M.	Right inguinal; cæcal; appendix adherent to sac.	Mar. 24, 1893	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Dec. 1894
36	14	F.	Right femoral.	April 4, 1893	Purse-string suture, kangaroo-tendon.	Primary union.	Perfect Dec. 10, 1894
37–38	12	M.	Double inguinal; recurrent few months after Czerny operation, done February, 1890.	Apr. 11, 1893	Bassini.	Primary union.	Perfect Oct. 6, 1894
39	13	M.	Right inguinal, complicated with undescended testis	Feb. 1893	Bassini.	Primary union.	Perfect Feb. 1894
40	5	M.	Right inguinal.	April 4, 1893	Bassini.	Primary union.	Perfect Feb. 27, 1894
41	7½	M.	Strangulated; cæcal and appendix.	June 1, 1893	Appendix removed.	Primary union.	Perfect; died four weeks later of another trouble.
42	11	F.	Right femoral.	June 6, 1893	Purse-string suture.	Primary union.	Perfect Oct. 20, 1894
43	9	M.	Right inguinal; cæcal.	June 13, 1893	Bassini.	Primary union.	Perfect Sept. 28, 1894
44	11	M.	Right inguinal.	June 18, 1893	Bassini.	Primary union.	Perfect Oct 20, 1894
45	11	M.	Right inguinal.	July 18, 1893	Bassini.	Very profuse suppuration to deep fascia.	Perfect Nov. 2, 1894
46	8	M	Right inguinal, congenital, with undescended testis.	Jan. 18, 1893	Bassini. Kangaroo-tendon for testis anchored to wire from outside scrotum; testis atrophied; no drain.	Primary union.	Perfect Oct 1894; testis atrophied.
47	9	M.	Right inguinal, 7 years' duration	Aug. 18, 1893	Bassini. Kangaroo-tendon; no drain.	Primary union; 2½ weeks in bed.	Perfect Feb. 27, 1894
48	11	M.	Right inguinal, congenital; size of goose-egg.	Aug. 1893	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Oct. 11, 1893; not traced.
49	8	F.	Umbilical, congenital.	Aug. 29, 1893	Omphalectomy suture; 3 large kangaroo-tendons for buried suture.	Primary union.	?
50	11	M.	Right inguinal, congenital; truss 11 years.	Aug. 11, 1893	Bassini. Kangaroo-tendon; no drain.	Primary union, three weeks.	Well Dec. 1894
51	12	F.	Right femoral; 7 years' duration; truss entire time.	Sept. 25, 1893	High ligation of sac; purse-string suture of canal; kang.-tendon.	Primary union, three weeks.	Well Nov. 1893

No.	Age	Sex.	Nature of hernia and duration.	Operation.	Operator.	Primary result.	Final result.
52	5	M.	Right inguinal, congenital.	Oct. 10, 1893	Bassini. Kangaroo-tendon.	Primary union, 2½ weeks.	Well Nov. 1, 1894
53	12	M.	Right inguinal; 6 years' duration.	Oct. 10, 1893	Bassini. Kangaroo-tendon.	Primary union.	Well Oct. 6, 1894
54–55	5	M.	Double inguinal, congenital, large.	Oct. 17, 1893	Bassini. Kangaroo-tendon.	Primary union.	Well Sept. 25, 1894
56	10	M.	Right inguinal; duration 3 years.	Nov. 14, 1893	Bassini. Kangaroo-tendon.	Primary union.	Well Sept. 29, 1894
57	7	M.	Right inguinal, size of goose-egg; since infancy.	Nov. 14, 1893	Bassini. Kangaroo-tendon.	Primary union.	Well Oct. 1, 1894
58	4½	M.	Right inguinal; cæcal.	Nov. 21, 1893	Bassini. Kangaroo-tendon.	Wound healed primarily; orchitis which suppurated second week.	Well April 26, 1894
59–60	14	F.	Double inguinal.	Nov. 28, 1893	Bassini. Kangaroo-tendon.	Very slight suppuration on suture-hole.	Well Nov. 3, 1894
61–62	8½	M.	Double inginal, congenital; size of fist both sides.	Dec. 1, 19, 1893	Bassini. Kangaroo-tendon.	Primary union.	Well March 6, 1894
63–64	6	M.	Double inguinal, with Pott's disease.	Left, Dec. 22, 1893; right, Feb. 6, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Feb. 5, 1894
65	7½	M.	Right inguinal, since 5 weeks old.	Dec. 29, 1893	Bassini. Kangaroo-tendon.	Primary union.	Perfect Nov. 3, 1894
66	5	M.	Left inguinal, with Pott's disease.	Jan. 9, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Nov. 1894
67	3¾	M.	Left inguinal, complicated with Pott's disease.	Jan. 9, 1894	Bassini. Kangaroo-tendon.	Primary union.	Died few weeks later tubercular meningitis.
68–69	6	M.	Double inguinal, with Pott's disease.	Jan. 30, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Sept. 1894
70	6	M.	Right inguinal, congenital.	Jan. 30, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Oct. 1, 1894
71	7½	M.	Left inguinal; hernia in infancy cured with truss; relapsed 2 years ago.	Feb. 13, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Sept. 29, 1894
72	4	M.	Left inguinal, congenital; size large orange.	Feb. 13, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Apr. 6, 1894
73–74	2½	M.	Double inguinal, congenital; truss since 6 weeks old; very large; uncomfortable.	Right, Feb. 16; left, Sept 27, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Dec. 1, 1894
75	6	M.	Right inguinal.	Feb. 1894	Bassini. Kangaroo-tendon.	Primary union.	Died on 8th day; double pneumonia confirmed by autopsy.
76	10	M.	Left inguinal; very large.	Mar. 30, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Dec. 1, 1894
77	9	M.	Right inguinal, scrotal; since infancy.	Apr. 10, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Oct. 6, 1894
78	12	F.	Double inguinal; operation right side; congenital.	Apr. 20, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Dec. 1893
79	8½	M.	Right inguinal; duration 6 years; hernia vermiform appendix.	Apr. 20, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Dec. 15, 1894
80	6	M.	Left inguinal; 3 years truss treatment.	Apr. 19, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Sept. 1894
81	14	M.	Left inguinal; since infancy.	May 8, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Dec. 1894
82	4	M.	Right inguinal; cæcal; operation for recurrence; size goose-egg; irreducible, adherent.	May 15, 1894	Canal sutured with kangaroo-tendons; gauze-drain.	Primary union except at site of drain.	Well Dec. 11, 1894
83	11	M.	Right inguinal; 8 years.	May 8, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Aug. 21, 1894

No.	Age	Sex.	Nature of hernia and duration.	Operation.	Operator.	Primary result.	Final result.
84	3	F.	Hernia of umbilical cord, congenital; size goose-egg.	Nov. 1893	Excision of umbilicus and sac; suture fascia; kangaroo-tendon; catgut for skin.	Primary union.	Slight relapse few weeks after operation.
85	13	F.	Umbilical; since infancy.	June 12, 1894	Excision of umbilicus; sutures kangaroo-tendon buried.	Primary union.	Perfect Oct. 17, 1894
86	9	M.	Left inguinal, congenital; undescended testis.	June 12, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Oct. 5, 1894
87	8	M.	Right inguinal; since infancy; truss 3 years.	June 23, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Nov. 12, 1894
88	4	F.	Ventral; size of English walnut, just above navel.	June 19, 1894	Suture fascia with kangaroo-tendon.	Primary union.	Perfect Oct. 1894
89	7½	M.	Right inguinal.	May 18, 1894	Bassini.	Primary union.	Perfect July, 1894
90	4	F.	Right inguinal; 2½ yrs.	July 6, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Oct. 4, 1894
91	7	M.	Right inguinal, complicated with reducible hydrocele.	July 9, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Sept. 1894
92	6	M.	Right inguinal, since 3 months old.	July 10, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect
93	10	M.	Left inguinal; 4 years.	July 10, 1894	Bassini Kangaroo-tendon.	Primary union.	Perfect Nov. 3, 1894
94	7	M.	Right inguinal; since 6 weeks old.	July 20, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Aug 24, 1894
95	9	M.	Right inguinal; truss 2 years.	July 20, 1894	Bassini. Kangaroo-tendon.	Primary union.	
96	12	M	Right inguinal, congenital.	July 27, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Oct. 4, 1894
97	10	M.	Right inguinal.	Aug. 3, 1894	Bassini. Kangaroo-tendon.	Primary union.	Sound Dec. 15, 1894
98–99	9	M.	Double inguinal, with double reducible hydrocele.	Aug. 7, 1894	Double Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Nov. 13, 1894
100	7	M.	Right inguinal; vermiform appendix, adherent, reducible.	Aug. 14, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Nov. 24, 1894
101	14	M.	Left inguinal; since infancy; relapsed after truss "cure."	Aug. 14, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Sept. 24, 1894
102	9	M.	Right inguinal, congenital; truss 7 years.	Aug. 21, 1894	Bassini. Kangaroo-tendon; no drain.	Slight suppuration tenth day.	Perfect Oct. 11, 1894
103	4	M.	Right inguinal; since infancy	Aug. 28, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Oct. 4, 1894
104	10	M.	Right inguinal; 7½ yrs.; truss 6 yrs.	Sept. 5, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union	Perfect Oct. 3, 1894
105	9	F.	Right inguinal; 6 years.	Sept. 27, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Nov. 1894
106	4	F.	Right inguinal.	Oct. 4, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Nov. 1894
107	11	F.	Right femoral; 6 years; size of egg.	Oct. 5, 1894	Excision of sac; suture canal; kangaroo-tendon; no drainage.	Primary union	Perfect Dec. 1894
108	5	M.	Right inguinal; 3 years.	Oct. 1, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Dec. 1894
109	6	M.	Right inguinal, congenital; truss 4 years.	Oct. 9, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Dec 1894
110	6	M.	Left inguinal; 3 years	Oct. 1, 1894	Bassini. Kangaroo-tendon.	Primary union	Perfect Dec. 1894
111	5½	M.	Right inguinal, with large reducible hydrocele.	Oct. 9, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Dec. 1894
112	9	F.	Right inguinal.	Oct. 9, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Dec. 1894
113	6½	M.	Right inguinal; 4½ yrs,	Oct. 9, 1894	Bassini. Kangaroo-tendon.	Primary union.	Perfect Dec. 1894
114–115	11	M.	Double inguinal.	Oct. 25, 1894	Double Bassini. Kangaroo-tendon right side; chromicised catgut left.	Fourth week small sinus at site of suture where catgut used.	Perfect Dec. 1894
116	13	M.	Right inguinal; 6 years.	Oct. 26, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Dec. 1894
117	12	M.	Right inguinal; since infancy.	Oct. 26, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Dec. 1894

No.	Age	Sex.	Nature of hernia and duration.	Operation.	Operator.	Primary result.	Final result.
118	11	M.	Left inguinal; 3 years.	Oct. 26, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Dec. 1894
119–120	10½	M.	Double inguinal; 3 yrs.; treated 3 years with truss.	Oct. 26, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Dec. 1894
121	5 mos	M.	Strangulated inguinal right; strangulated 48 hours.	Oct. 22, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Dec. 1894
122	5	M.	Right inguinal.	Nov. 1, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Dec. 1894
123	4	M.	Right inguinal.	Nov. 8, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union	Perfect Dec. 1894
124	13	M.	Right inguinal.	Nov. 2, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Dec. 1894
125	7½	M	Double inguinal; operation left side; 7 years' truss treatment.	Nov 16. 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Dec. 1894
126	7	M	Right inguinal.	Nov.15, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Dec. 1894.
127–128	9	M.	Double inguinal; 5 years	Nov.30, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Dec. 1894
129	7	M.	Right inguinal; size of orange; since infancy.	Nov.23, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Dec. 1894
130	7	F.	Right inguinal; 2½ yrs.	Dec. 1, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Dec. 1894
131	23 mos	M.	Strangulated, right inguinal	Dec. 7, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Dec. 1894
132–133	5½	M.	Double inguinal; duration 4½ years.	Dec. 7, 1894	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect Dec 1894
134	12 mos	M.	Left inguinal strangulated.	Feb. 1893	Bassini. Kangaroo-tendon; no drain.	Primary union.	Perfect July, 1894

OSTEOMALACIA, WITH A NEW CASE.[1]

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Mrs. R., aged twenty-four years, housewife, was admitted to the hospital of the University of Michigan April 1, 1892, and gave the following history:

Father in good health, but appears to have had syphilis. Mother has a goitre, "large as a man's head," of twenty-five years' duration; otherwise well. Patient has four brothers, all strong and healthy. Neither the patient nor the father know of any bone-disease or malignant disease in the family.

Patient was born in northwestern Pennsylvania, but has lived in the northern part of the lower peninsula of Michigan for thirteen years. As a child patient was not strong; was frequently affected with diarrhœa; had whooping-cough; in the fall of 1891 had a severe attack of diphtheria. Menstruation began at thirteen and was normal. At seventeen was married to a healthy young man who worked a small farm. Two years after marriage the first child was born. During the pregnancy there were frequent attacks of rheumatic pain which patient cannot clearly describe. Delivery was normal, but there was difficulty in the removal of the placenta. This was followed by hemorrhage so severe that patient "nearly bled to death." The hemorrhage was checked by cold douches, which were followed by severe pain in the pelvis. This pain has continued, varying in severity, to the present time. Notwithstanding the complications mentioned the patient nursed the child (a boy) for fourteen months. Two years after the birth of the first child she had a second. The placenta was again adherent, and its removal followed by hemorrhage. She nursed this child (girl) for fourteen months. The children, five and three years of age, are well grown and healthy. The boy has a congenital deformity of the right thumb, the metacarpus and first phalanx being absent and the terminal phalanx rudimentary.

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[1] Read, with demonstration of specimens, at the meeting of the Association of American Physicians, Washington.

In the spring of 1890 pains came on gradually in the knees. The joints were sore and painful, especially in bad weather, increased by walking, but there was no stiffness. There was also pain in the liver-region and between the shoulders. The pain was severe and constant, and gradually grew worse for about six months, when it remained about the same. On the 25th of December, 1890, the patient slipped while getting out of a sleigh, and fell lightly to the ground. On rising she found the left femur broken at the upper part. A physician could not be obtained for a day. There was great pain, but no swelling. The thigh was bandaged and extension applied with a twenty-pound weight. After eight or nine weeks the bone had united with slight deformity. The patient could not walk, however, but seemed to have lost all her strength. The pains in the legs and body continued, but the patient was able to sit up nearly every day. In the summer of 1891 the patient was treated in a homœopathic hospital, probably for ununited fracture, though perhaps for rheumatism. There was no improvement, but the condition grew worse. Painful cramps began in the right leg. At that time the patient noticed that her right leg was "drawing-up," and that her heart beat rapidly. In August, 1891, while raising herself in a chair, she strained the right arm. Since then the arm and shoulder have been painful. In December, 1891, she went to bed on account of severe pain in the pelvis, worse at the menstrual period, and cramp in the legs, and has not been able to sit up since then. She has become very weak; has frequent "fainting-spells" and palpitation of the heart. The appetite is very poor, vomiting after meals rather frequent. The bowels are regular. Sleep is interrupted by coughing and pain. Cough is frequent, with abundant expectoration. Menstruation absent for three months.

Status præsens, April 1, 1892. The patient lies on her back; her expression indicates great pain. There is slight deafness, and the memory and intelligence of the patient are very poor. The normal height is not known; the patient measures now 139 cm. from vertex to right heel. Weight has been 148 pounds, now not more than 110. The bones of the upper part of the body and arms are slender; those of the legs thick. The skin and mucous membranes are pale. The panniculus is wasted everywhere; the muscles small and flabby. Tongue yellow coated, voice nasal. Thyroid enlarged, especially the middle and right lobes; this has existed since puberty.

Thorax narrow, flattened in front and at the sides. The manubrium concave, especially on the right side. The ribs are very yielding and elastic, painful on pressure. On the right side, in the habitual position, the ribs are in contact with the crest of the ilium; on the left side the twelfth rib is a hand's breadth from the ilium. The distance between the anterior superior spines is 23 cm., between the iliac crests 28.5 cm. The iliac bones yield when pressed together, and spring back when released. The pelvis is very flat, the promontory being on the same plane as the pubis. The promontory could not be reached when examined *per vaginam.* (The pelvis was examined in the obstetric clinic, but the notes of measurements have been lost.)

The left femur lies in front of the right, resting on the latter just above the knee. The bone is strongly curved forward and then inward at the upper third, where there is a fracture with great thickening of the bone. The lower end of the left patella is 28 cm. below the pubis.

The femur cannot be adducted or abducted on account of spasms in the muscles. The shaft of the femur is thickened in its whole length. There is free motion in the left knee. The left tibia is well formed, as are also the foot and ankle.

The right femur, greatly thickened, is curved outward in the upper part; inward below. There are fractures at the upper and lower thirds and just above the condyles. There is also crepitus at the upper end, apparently in the surgical neck. The knee is turned in and a little to the right of the median line. The lower end of the patella is 35 cm. below the edge of the pubis. There is crepitus in the knee-joint. The right tibia is thickened, especially at the lower third, where there is a large hard mass. The right foot and ankle are well formed. The heel extends 5 cm. beyond that of the left foot.

During the examination strong contractions came on in the muscles of the legs, especially those of the right thigh. These could be brought on by a slight touch, but were sometimes spontaneous. For this reason the knee-reflexes could not be carefully examined. There is no ankle-clonus on the left side, but it is present on the right.

The clavicles and arms show no deformities. Motion of the right arm is painful.

Examination of mouth, pharynx, and larynx negative. The copious purulent sputum (pharyngeal) was examined many times for tubercle bacilli, with negative results.

Percussion and auscultation of the lungs negative.

Apex-beat in the fourth intercostal space, just outside the nipple-line. There is a strong impulse over the whole cardiac area. The absolute heart-dulness begins on the third rib and extends to the position of the apex-beat and to the left edge of the sternum. The heart's action is very rapid, but regular. The first and second sounds very much alike at the apex. The pulmonary second is loudest just below the clavicle and ends in a distinct click.

Radial pulse 135, small, tension low.

Examination of the abdomen negative. Liver-dulness from the fourth intercostal space in the right parasternal line to two fingers' breadth above the costal margin in the same line. In the median line the dulness ends just below the tip of the ensiform.

Splenic dulness not enlarged.

The urine was examined frequently during the patient's stay in the hospital; but as it was often passed involuntarily systematic quantitative examinations could not be made. Quantity: 900–1500 c.c. (twenty-four hours). Sp. gr.: 1008–1014. Reaction: usually alkaline. Color: pale yellow, turbid. Odor: peculiar, disagreeable, "onion" odor. Albumin: always a trace, to about one-eighth bulk on standing. Albumose was usually present in small quantity; after precipitation of the albumin by acetic acid and heat and filtering, the filtrate gave positive tests,as precipitation with HNO_3 in the cold, disappearing on heating. Indican: always in slight excess. Diazo-reaction: usually a deep orange-red. At one time for three successive days, in connection with a rise of temperature of unknown origin, gastric disturbance, and headache, a reaction was obtained, of deep garnet-red color, with pink foam. Fehling's test always negative. Urea: 14 to 21 grm. in twenty-four hours. Numerous tests for lactic acid negative. Sediment: always a heavy deposit of triple phosphate crystals, calcium oxalate, and amorphous phosphates; many leucocytes, epithelial cells, cylindroids, and occasionally a few short hyaline casts.

During the first month after leaving the hospital urine was examined a number of times, showing absence of albumose and decrease of albumin. Urine usually acid, with small amount of sediment.

From September, 1892, until time of death, small calculi were constantly passed with the urine. These were either very hard, shining, sharp-pointed crystals of calcium oxalate, or dark-brown, smooth, and soft concretions of calcium phosphate. During this time the urine was alkaline. Sediment was so great that the pus-basin used as a urinal would be heavily coated. Masses of phosphate "mud" were frequently passed, consisting of thick deposit of "coffin-lid" and amorphous phosphates; albumin constantly present at this time, but not in large amount; albumose in small quantities.

As urine could not be collected with any accuracy, the exact quantitative estimation of phosphates could not be made.

For about six weeks the patient grew worse. The temperature rose daily to 102° or 103°; there was frequent vomiting of food and bile, several times mixed with blood. Patient could not move at all, and necessary moving caused intense pain and contractures. Spasmodic contractions, often spontaneous, were frequent, especially in the muscles of the thighs. Gradually the femurs were bent further inward and upward, so that the legs were crossed above the knees, the left femur lying upon the right, as in the illustration. There were also cramps in the right arm. From two to five times daily there were attacks, beginning with dizziness and passing into unconsciousness. The pupils dilated; head moved from side to side; there was marked tremor of right extremities, beginning in fingers, involving the whole arm, and then appearing in the leg. These attacks lasted from two to ten minutes, and were followed by intense headache.

About the middle of May improvement began. Vomiting ceased; appetite and bowels became normal; fever disappeared, and the patient had no more fainting-spells. The cramps and pains also decreased, and the softening and bending of the bones seemed to be at a standstill. By August 1st the condition had become very much improved. The patient could raise her right hand to the head and lift the left leg up from the right. She had increased in flesh. About this time (August 1st)[1] she left the hospital and was taken to a boarding-house. Here, under the most unfavorable conditions, still greater improvement was made. All gastric symptoms disappeared; she had a ravenous appetite, and ate heartily of the plainest food. Bowels were regular; temperature normal; there were no fainting-attacks, pains, or cramps. Menstruation began after an absence of eight months. Bones seemed to become harder and thorax less elastic; the fractures in the femurs had apparently united. Crepitus disappeared; the legs could be moved without pain. Patient could move from one side of the bed to the other, and could sit propped up with pillows. Could use right arm freely, but motion in shoulders was restricted. She passed her time in sewing. The cough and expectoration continued.

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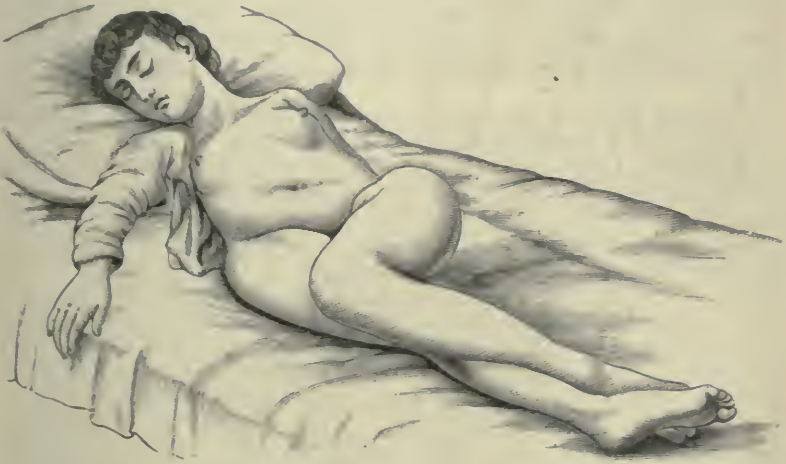
[1] She was observed after this time by my assistant, Dr. A. S. Warthin, to whom I am indebted for valuable assistance in the study of the case.



In October it became evident that the disease was again progressing. The patient lost flesh; pain returned in the limbs; the fainting-spells began; digestion was much disturbed, with marked tympanites, acid eructations, vomiting, and complete loss of appetite. The right femur became very sensitive, and the patient could no longer move about on the bed; could lift the right arm only by the aid of the left. The mind was greatly depressed and irritable. At times there was slight delirium, and sleep was disturbed. Toward the last of September, as mentioned, she began to pass small calculi, very hard, with sharp-pointed surfaces, causing intense pain before and after urination. She had previously passed a few at long intervals. By October 1st there was severe cystitis. Bladder was sounded for stone, but none found. There were numerous attacks of severe renal colic daily. Menstruation had again ceased, and never returned. Changes in the thorax became more noticeable; the sternum seemed to have slipped down toward the abdomen; heart-dulness displaced still further upward; the right clavicle was bent backward; the left leg was curved and drawn upward more than before.

From October to February, 1893, the condition gradually grew worse, though there were many periods when the patient seemed much better. The cystitis improved under treatment, and the gastric symptoms also; but there was much pain from the passage of gravel, and attacks of renal colic were of almost daily occurrence. In February the patient was moved to a new house freshly papered and damp. She took cold, and from that time the disease made rapid progress. She could not make any voluntary movements except limited motion of the hands. Complained constantly of severe pains throughout whole body, especially in back. All necessary handling of the patient was exceedingly painful. Fainting-spells were frequent, and patient became greatly depressed and fretful. Gastric symptoms became worse, and neither food nor medicine could be retained. There were frequent periods of collapse, with rapid, weak, and irregular heart. The passage of gravel and the attacks of renal colic increased. Cramps began in the muscles of the back, and kyphosis formed gradually. Two large bedsores now appeared—one on the sacrum, the other on the right leg under the knee, where it pressed on the left. The thorax seemed more yielding. The right femur became soft and elastic. A loud systolic murmur developed over the heart-area. There was decreased resonance over the left lower lobe of lung.

On April 26, 1893, the patient, while complaining of severe pains in the back, had a fainting-spell, which ended fatally.

Treatment. During the first five weeks of patient's stay in the hospital treatment was wholly symptomatic. A concentrated syrup of lime was prescribed later, but as the gastric symptoms became so much worse it was stopped. Phenacetin, quinine, and salicylates had no effect upon the pains and did not reduce the temperature. The after-effects of morphine were so disagreeable and the general condition was made so much worse by it that it was given but a few times. Codeine was given with good results, in the form of codeine phosphate, gr. ⅓ p. r. n., the daily dose being from one to four grains. The pains were immediately relieved by this; the patient slept well; gastric symptoms improved; and there were no unpleasant after-effects. The temperature, which every day had ranged from 99° to 102° or 103°, fell to 98°–99°, and remained there with but two or three slight variations. This fall of temperature took place on the third day after the use of codeine was begun, and was permanent.

From this time until the patient left the hospital, about eleven weeks afterward, codeine was constantly given; and all through this period there was constant improvement, as mentioned above. As gastric symptoms subsided the concentrated syrup of lime, fʒj t. i. d., was given again. After leaving the hospital the codeine (gr. ⅓, at night) and syrup of lime were continued. In addition maltine with hypophosphites was given, f℥ss t. i. d. The diet was largely of cereals. Phosphorus, in doses of gr. $\frac{1}{100}$, was also tried; but the patient complaining that it caused stomach disturbance, it was stopped, and it was also necessary to discontinue the use of maltine and the syrup of lime on account of similar conditions. The treatment by chloral hydrate, as recommended by Petrone,[1] was also tried, fifteen grains being given t. i. d. for a month. Through all this time the condition became gradually worse. After this no further attempt was made to carry out specific treatment, and attention was given to the most important symptoms. Of these the renal colic received the chief attention, and was treated in every possible way, without great success. The calculi were constantly formed, and were passed in incredibly large numbers, often twenty daily, besides large quantities of sand. The patient became accustomed to the codeine, so that the dose was increased finally to eight grains daily; it then seemed to lose its effect, and during the last five weeks it was necessary, on account of the extreme pain, to keep the patient almost constantly under the influence of morphine.

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[1] La Riforma Medica, 1892, No. 163, in Centralblatt für Bakt. u. Parasitenkunde, 1892, Bd. xii. p. 865.

Autopsy, two hours after death. No rigor mortis. Large amount of subcutaneous fat. Omentum well preserved. Diaphragm at level of third rib on the right and third intercostal space on the left. Sternum soft, but partly calcified. Ribs can be cut through with a knife, but have thin shells of bone. They are much atrophied, the larger ones measuring 10 x 2 mm. on section, the cartilage just beyond the articulation measuring 13 x 5 mm., and not swollen.

Lungs partly distended. Left lower lobe collapsed; surface granular, pink, with small, yellowish nodules (emphysema). Slight injection of bronchial mucous membrane.

Pericardium contains normal amount of fluid. White spot, size of dime, over right ventricle; several small cloudy spots on posterior wall.

Heart of normal size, lying one interspace higher than normal. Right ventricle contains small, soft, white clot continuous with a currant-jelly clot. Tricuspid and pulmonary valves normal. Left ventricle contains very long currant-jelly clot extending into auricle and aorta. Mitral and aortic valves normal; aorta narrow; intima smooth.

Liver slightly smaller, but otherwise apparently normal. Spleen 13 cm. long, 4 wide, 3 thick, anæmic, and rather hard. Cut surface dry, glistening. Malpighian bodies show faintly; the trabeculæ increased.

Left kidney 11 x 4.5 x 4 cm. Pyramids anæmic, with small white specks (calcareous); also similar white specks, size of small pinhead, in the pale cortex. Pelvis contains numerous small calculi. Left ureter normal. Right kidney 10 x 6 x 4 cm. Contains numerous white specks like those in the left kidney in all parts; pelvis contains numerous calculi. Right ureter dilated in its whole length. Seven small, hard, irregular calculi are lodged in its lower end just above the bladder.

Bladder contracted; contains two small calculi.

Uterus 5 x 3 cm.; pale. Tubes normal. Ovaries fibroid; 4½ x 1½ cm., white, anæmic, and nodular on the surface, with small cysts in the interior. The vessels in the ligaments show no abnormality.

All the bones of the pelvis are soft, cutting easily and breaking down like wet and rotten wood under the finger. The pubic arch on the same plane as the promontory, and distant from the latter 10 cm. The superior outlet of the pelvis of normal shape. The left acetabulum is lower down than the pubis, and points directly outward; the right one in the normal position.

The bones of the upper extremities can be bent or indented by pressing the fingers through the skin, but are not deformed. The clavicles and scapulæ and skull are hard and unyielding (as felt through the skin).

The bones of the lower extremities are all soft. The right tibia is broken just below the knee, and curved where it is crossed by the left.

Both femurs are strongly curved outward at the upper third; their heads are distorted and atrophied; the necks almost obliterated; the great trochanters higher than the head; the shafts irregularly thickened; the condyles distorted and atrophied. The right femur has fractures without evidence of callus at the upper third and the lower third, and another just above the condyles, which may have been made at the autopsy.

The left one has a fracture at the upper third, and one above the condyles, both probably made in getting out the bone. Under the periosteum just above the condyles on the anterior surface of the left femur is a soft area 2 x 3 cm. in diameter.

The muscles of the thigh are very anæmic and yellow, especially close to the bone. There is also an unusual amount of interstitial fat.

The femurs were split longitudinally with a knife and show similar conditions on the whole, with slight variations to be mentioned.

The diameters of the right femur, which are not far from those of the left, are as follows: head, 37 mm.; neck, 33 mm.; just below trochanter, 35 mm.; upper third, 30 mm.; middle, 42 mm.; lower third, 47 mm.; above condyles, 30 mm.

The head of the femur has a soft cartilaginous shell; the insertion of the ligamentum teres was pulled out in removing the bone. Within the shell is pale-yellow fat, containing numerous fine spicules of bone.

The shaft is compressible throughout its length, deriving most of its strength from the periosteum. The neck and upper part of the shaft usually contain fatty marrow with variable quantities of spicules, filling in the whole width of the bone. On the outer side, just above the upper fracture, is a strip of pale-red marrow extending from the periosteum inward from ½ to 1 cm. This also contains spicules of bone. Just below the great trochanter is a roundish mass, 15 mm. in diameter, having the color and consistence of hyaline cartilage. It is continuous with the yellow marrow on one side, but free on the other, without having a definite capsule. On section this shows small cystic cavities, containing colloid substance.

In the middle of the shaft is a cyst, oval in shape, with diameters of 40 and 30 cm., lying obliquely to the long axis and reaching to the periosteum on one side. Its walls are smooth and translucent, hard to the touch in some places, but can be cut with a knife.

Above this are two areas undergoing cystic softening; below it several others of different sizes, the largest measuring 20 x 17 mm. in diameter. The smaller cysts contain unaltered blood (microscopic examination); the larger ones clear, odorless, oily fluid of neutral reaction. This did not give the chloride of iron and carbolic reaction for lactic acid, but was not tested otherwise.

The middle half of the shaft contains pink or red lymphoid and gelatinous marrow alternating, filling in the upper part of the bone cavity, from the periosteum, ⅔–¾ of the diameter; the outer ⅓–¼ being filled with fatty marrow. Both kinds of marrow contain the bone-spicules described. From the lower third of the femur the inner part is made up of fatty marrow continuous with that of the condyles. The widest part of the shaft is that containing the greatest amount of red lymphoid or gelatinous marrow. The former has a consistency, when fresh, varying from that of a fresh blood-clot, to a normal, slightly hyperæmic spleen. The gelatinous marrow, darker red, has the consistency of œdematous connective tissue. The fatty marrow, including the parts in the head and condyles, is very anæmic.

The condyles have only a thin cartilaginous shell, filled with yellow marrow and trabeculæ, the latter being more numerous than those in other parts. Only in the part within the intercondyloid notch is there a small amount of red, gelatinous marrow.

The left femur presents changes on the whole like those of the right. It is, however, not so curved in the shaft. It contains also very few, and these small, cysts.

In the lower part of the shaft is a soft mass, just beneath the periosteum, measuring 2 x 3 cm. in diameter. On section this is dark red, resembling a blood-clot, but firmer; it is intimately adherent toward the centre of the bone to a firmer whitish (lymphoid) tissue.

The bones of the pelvis have hard but very thin plates of bone under the periosteum, but can be cut through with a cartilage-knife. The space between the plates is filled with yellow, dirty-looking, fatty marrow, traversed by spicules of bone and trabeculæ, some of which are as much as 2 mm. in diameter.

Owing to a misunderstanding the other bones could not be examined.

Microscopic examination. For histological examination I could use only the femurs, parts of the pelvis, and a piece of rib. These were examined fresh, and after hardening in Müller's fluid and in alcohol. The specimens hardened in alcohol were decalcified by von Ebner's solution.

Femur. The periosteum is thickened almost everywhere, and has a fibroid structure with few nuclei.

The original compact layer of bone can nowhere be recognized. Immediately beneath the periosteum is a layer of fibrous tissue containing bony tissue in considerable quantity. This layer is usually from 0.5 to 1.5 mm. in thickness, but in some places, as near cysts, it extends further toward the centre of the femur. There is not a larger quantity, however, at the seats of fractures. The outer layer of bony tissue is made up of spicules of bone, which can best be examined by tearing out with forceps. They appear then as compound, branching processes, often perforated or forming meshes. The condition as regards calcification can best be recognized in the fresh state, or by pulling out splinters, rather than in sections.

Examined in this way it can be seen that the spicules are usually calcified, but not in their whole extent. Usually there is an irregular border on one or both sides, and sometimes the fibre is free from lime in its whole width for some distance, the margins of the calcified part being rather uneven. The calcified areas contain lacunæ and canaliculi, which are usually of normal appearance, though sometimes the lacunæ are large and the canaliculi few or absent. The calcified part usually shows distinct lamellæ. The uncalcified part is either homogeneous or finely granular, or less frequently coarsely fibrillated longitudinally. Occasionally it shows small lacunæ. Transverse perforating fibres cannot be distinctly seen.

These fibres or spicules, as stated, form part of the outer layer of the femurs, but they do not form a continuous layer, nor does their direction or the course of their lamellæ indicate that they are part of the original compacta, except in rare instances. This is true of transverse as well as longitudinal sections. The fibrous tissue in which they lie varies greatly in character in different parts. In some places it is dense and firm-looking; in others, soft, loose-meshed, or even having a myxomatous appearance. Long spindle, or oval or stellate cells lie rather sparingly in the fibrous tissue, and in some places there are collections of small round cells, occasionally cells resembling marrow-cells (eosinophilous rarely), and at times polynuclear giant cells. Usually the fibres of connective tissue are parallel to the spicules, and present in sections an alveolar arrangement. This tissue is perforated by large but thin-walled vessels. In sections the structure of the bone-spicules cannot be made out so clearly as in fresh specimens, but in sections made from preparations decalcified in Müller's fluid the so-called "carmine border" can sometimes be made out, corresponding to the decalcified parts described. In stained sections the bone-corpuscles usually appear in the parts previously calcified, but they are often small and stain badly. In sections the edges of the bone-fibres are usually smooth, but sometimes they are irregular, as if gnawed. Sometimes the edge of the fibre is lined by a thin membrane containing spindle-shaped nuclei, but typical osteoblasts cannot be found. Occasionally cells having the aspect of osteoclasts may be seen lying close to the edge of the bone.

Within this denser layer, but often passing into it gradually, is the widened marrow-cavity with its different kinds of contents as described above.

There are microscopic differences corresponding to the macroscopic ones. The simplest tissue is the yellowish part of the marrow. This appears under the microscope as fat tissue, with a varying amount of lymphoid marrow between the vesicles. The lymphoid material contains besides the ordinary small round cells a small proportion of eosinophilous cells, usually two or three times the diameter of a red blood-corpuscle, with a single round or oval nucleus. There are also in this part a few epithelioid cells with pale nuclei, and very rarely polynuclear giant cells. Bony spicules are rare in this tissue in the shaft.

The reddish marrow shows usually a small spindle-celled structure, containing large numbers of giant cells. These have from two to thirty or forty, usually more than eight to ten, round or oval nuclei in the centre or near one end of the body of the cell. The cells vary from 10 to 50 μ. in diameter, are usually round or short oval, but sometimes long oval. They are never of irregular outline, like those in myeloid tumors. The nuclei usually stain deeply with nuclear dyes. The bodies take protoplasmic dyes well, but often have contents which affect the color, such as blood-pigment or bits of osteoid tissue. In this tissue there is often an apparent structure, in that the spindle cells lie in whorls or form strands or rays, like those in a fibroid tumor. The giant cells often lie in the centres of such concentric masses. The tissue is well supplied with vessels, usually with thin muscle-walls, and contains more or less blood-pigment. In this kind of tissue spicules of bone occur in various proportions. They are usually devoid of structure, are homogeneous, with few or no bone-corpuscles. The sides are sometimes smooth, sometimes uneven, and occasionally have giant cells lying in spaces apparently excavated in them. These osteoclasts are precisely like the other giant cells described above.

The gelatinous marrow shows usually a very loose-meshed fibrillated or myxomatous mass, with round, spindle, or stellate cells, and contains varying proportions of the elements just described as entering into the red marrow.

The walls of the cysts are made up of dense fibrous tissue, with trabeculæ of bone, sometimes in considerable quantity.

The cartilaginous tumor in the upper part of the right femur is made up of lobules of hyaline cartilage surrounded by fibrous tissue. The hyaline basis contains cells in large capsules; the centre of each lobule contains a softening cyst, the contents of which are sometimes colloid, sometimes finely fibrillated like young connective tissue, but without nuclei. In some of the lobules are small areas of calcification. The tumor has no special sheath, but is continuous with lymphoid marrow.

The dark-red tumor in the lower end of the left femur is composed largely of soft myxomatous or connective tissue containing osteoclasts. There are a few small bits of osteoid tissue, some of which are evidently undergoing absorption by the action of osteoclasts. There are areas of small celled infiltration in many parts, and several hemorrhages. Under the periosteum are small trabeculæ of osteoid tissue, some of which have fibrous ends. Large quantities of blood-pigment occur throughout the mass.

The pubis has thin shells of hard bony tissue, sometimes perforated by absorption of the bone, but usually showing the original structure. This is irregularly decalcified and absorbed toward the inner part of the bone. The periosteum of the pubis is not thickened. The trabeculæ resemble those of the femur in being partly, or in some places wholly, decalcified. The marrow is fatty, with lymphoid infiltration in different parts. The pubis contains no osteoclasts and very few giant cells of any kind. Occasionally one, usually small and with few nuclei, can be found in the lymphoid tissue.

The cartilage of the acetabulum and the head and condyles of the femurs is usually smooth on the outer surface. In most places the decalcification has extended into all the trabeculæ continuous with the cartilage, but sometimes traces of the original structure can be found.

In the ribs decalcification has not been so extensive. The outer layer is usually complete, but decalcification extends irregularly into the compacta, and is advanced in the cancellous part.

Of the other organs, changes of importance were encountered in the kidneys, spleen, and ovaries.

Kidneys. The kidneys contain extensive areas of small-cell infiltration in the cortex, and an increase of intertubular tissue with few nuclei in the pyramids. The infiltrations in the cortex are of varying size and shape, sometimes long and narrow, corresponding to the medullary rays, at other times irregular.

The epithelial cells on the whole are well preserved. Some tubules, in different parts, are dilated.

The capsules of Bowman are frequently thick and fibroid, sometimes having only a moderate thickness; sometimes the whole capsule is converted into a fibroid mass. The glomerulus capillaries are usually well preserved, but in some glomeruli some or all the loops are fibroid.

The arteries occasionally show thickening of the intima.

In various parts, especially in the tubules in the pyramids, are concretions, filling or even dilating the tubules, but without evidence of irritation around them. Concretions are also found in the cellular infiltrations, but not always.

Spleen. The spleen shows chronic hyperplasia, with increase of trabeculæ, but without increase of the lymphoid areas.

Ovaries. The ovaries have very few follicles. There are a few small cysts. Most of the tissue is made up of short spindle cells, in strands or rays, or firm connective tissue. There are few vessels. The vessels in the hilum seem normal.

The circumstances under which the patient was observed were so unfavorable for study that it is impossible to do more than mention briefly some of the points of interest involved.

The history of the case is not unusual, presenting as it does the common aspects of puerperal osteomalacia. In one respect the gross anatomical condition is interesting, namely, in the early and intense affection of the femurs. In the early fracture of the left one, and the prolonged lying in bed, we find the explanation of the absence of the typical osteomalacic pelvis—the beaked or heart-shaped pelvis. The difference in the consistence of the bones in the early and later stages, which led Kilian and others after him to distinguish *osteomalacia fracturosa* and *osteomalacia flexilis cerea*, is well illustrated by the early fractures and the gradual bending which took place during the last year of the patient's life.

Microscopically the changes found are those of a very advanced period, and bear out the ideas of recent investigators that the anatomical process is of a hyperæmic and inflammatory character. The inflammatory nature of the disease was asserted by Virchow (in his *Archiv*, Bd. iv., "Ueber Parenchymatöse Entzündung"). The theory is set forth by Von Recklinghausen in his exhaustive article, "Die fibröse oder deformirende Ostitis, die Osteomalacia und die osteoplastische Carcinose in ihren gegenseitigen Beziehungen" in the *Festschrift*, Rudolf Virchow zu seinem 71 Geburtstage, etc. (Berlin, Reimer, 1891). It is interesting to see, also, that although regeneration of bone has taken place to a marked extent, the new tissue has in turn broken down, so that many of the changes found represent late lesions, or degenerations, of a process itself secondary.

The large numbers of osteoclasts found might at first sight suggest the idea that the primary dissolution of the bone was due to these, a fact considered of great importance by some, denied by others. Careful examination, however, makes it certain that these bodies are in reality disposing of tissues of little value and probably predisposed to destruction.

Study of the bones in various parts makes it doubtful whether we can believe that the origin of the disease is to be found in inflammation or hyperæmia, and leads us back to the view, unsatisfactory as it is, that changes of a more recondite kind, either changes in metabolism or disturbances in the normal processes of breaking down and renewal of bone, lie at the basis of the disease.

As causes of the disease we find the commonest external conditions have been present in this case. The patient's own statement and that of her relatives threw no light on the subject, but it so happens that my colleague, Dr. Vaughan, saw the patient in her own home on the occasion of an outbreak of malignant diphtheria in the neighborhood. He describes the condition of the house and its surroundings as damp and unhealthy in the extreme.

The more direct causes of the disease which have been supposed at various times receive no light from this case. Now that the old theories of lactic acid, CO_2, and diminished alkalinity have been given up from insufficient evidence or contradictory facts, two theories remain. One is that of infection by bacteria, claimed by Kehrer, Petrone, and Latzko, for which there is no evidence and little probability, except that lent by the undoubted endemic nature of the disease in some parts; but even this is not constant, since localities once affected sometimes cease producing cases, as Ribbert has shown.

The other is that of Fehling (which includes the possibility of an assisting action in CO_2 or in diminished alkalinity), viz., that the disease is a tropho-neurosis, due to reflex irritation from the ovaries. The remarkable results of castration in osteomalacia seem to confirm this theory, but, while the facts cannot be questioned, there is a growing tendency to question the theory.

In many cases in which recovery followed the operation no abnormality could be discovered in the uterus, ovaries, or vessels.

Seeligmann, who had such a case (*Berliner klinische Wochenschrift*, 1893, No. 44, p. 1077), sees nothing in castration beyond the prevention of pregnancy and menstruation; but this does not seem possible in view of the number of cases in which neither of these was involved. I should remark here that in my own patient sexual desire seemed abolished, in striking contrast to the usual rule in osteomalacia.

The excretion of lime salts, the disposition of which in some cases is obscure, was very striking in my case, and its effects on the kidneys and ureters and bladder very important clinically and anatomically.

The results of the examination of the blood are of interest in connection with those of others recently reported.

Neusser (*Wiener klinische Wochenschrift*, No. 3, 1892, p. 45) found an excess of eosinophilous cells in the blood in a few cases of osteomalacia. In a case of senile osteomalacia, however, there was no increase of eosinophiles, but the blood contained myelocytes. He suggested the possibility of there being two forms of osteomalacia, differing in the manner mentioned as regards the blood. In a case cured by castration Neusser saw gradual decrease of the eosinophile cells. Rieder, however, found in one case only 3.6 per cent. of eosinophile cells, which cannot be looked on as an excess (*Beiträge zur Kenntniss der Leucocyten*, 1892). M. Sternberg in two cases found no increase of eosinophile cells and no myelocytes (*Zeitschrift für klin. Medicin*, Bd. xxii.). Tschistowitsch (*Berliner klin. Wochenschrift*, 1893, No. 38, p. 918) made careful examinations of the blood in osteomalacia and found no myelocytes. The eosinophilous cells varied greatly, but never exceeded 3.7 per cent. No effect could be observed on the number of these cells by castration. He found, however, that the lymphocytes were increased both absolutely and relatively, while the poly- and mono-nuclear cells were diminished. Tschistowitsch concluded, therefore, that besides the forms described by Neusser, in which there is an increase of marrow-elements in the blood, there is another form of osteomalacia with an increase of lymphocytes. I have been able to confirm the results of Tschistowitsch in my own case. The blood examined post-mortem shows 38 per cent. of lymphocytes, 52 per cent. of polynuclear cells, 9 per cent. of mononuclear and transition cells and less than 1 per cent. of eosinophile cells. There does not seem to me any reason for classifying cases of osteomalacia according to these peculiarities, as they are probably accidental, though it is important to have more observations on the blood, since it may be possible to learn something about the stage of the process as a whole from the alterations in the blood.

Diagnosis. Like all rare diseases, osteomalacia is frequently not diagnosed. Many text-books make it appear that in the later stages at least the disease cannot be mistaken. This assumes a greater knowledge of diagnosis than is possessed by a large number of physicians, and it seems desirable that the differential points be alluded to more frequently than they are in connection with diseases with which osteomalacia may be mistaken.

Even in Europe, in localities where the disease is not uncommon, cases are very frequently treated up to a very late period for other diseases. In my own case it seemed incredible that the nature of the affection had not been recognized before. Yet the patient was treated in a homœopathic hospital for other things at a time when the alteration in the right leg was progressing. I have strong reason for thinking that when the patient came to my clinic she did so at the instigation of a physician to get evidence, in order to proceed legally against the physician who set the first fracture.

Sternberg (*loc. cit.*) has recently called attention to the difficulty of diagnosis, and has given the important differential points to be sought for in distinguishing between osteomalacia and the diseases with which it is most easily mistaken. It is not necessary to quote these.

Osteomalacia is mistaken for some form of rheumatism more frequently than for all other diseases together. Much as the patient may think the pains rheumatic, a careful anamnesis and complete examination of the body would in most cases, except in the earliest stage, prevent error.

As regards treatment, the case teaches nothing new. The failure of the lime and the chloral was to be expected; they were given as experiments, with very little hope of doing good.

I regret very much that phosphorus was not given a more thorough trial. Had I known of the result obtained by Sternberg (*loc. cit.*) I would have given the remedy in large doses, but in the light of the earlier reports I did not feel encouraged to continue it after I found the first administrations badly borne.

Phosphorus and castration must be looked on as the chief remedies in the disease, the indication for the latter being especially the possibility of conception or the existence of pregnancy and need of Cæsarean section.

Osteomalacia in North America. The peculiar distribution of osteomalacia in various parts of Europe is such as to suggest local causes and led me to examine the history of the disease in America (North). Cases of "mollities ossium," "malacosteon," "fragilitas ossium," and "osteomalacia" have been frequently reported in the medical journals. I have examined all those under various headings in the *Index Catalogue* and the *Index Medicus,* but find that only a small number can be considered as genuine cases of osteomalacia. Most of them are cases of osteomyelitis, caries, tuberculosis, sarcomatosis, cancer, or ragility.

The first report was made by J. W. Tenny, in 1839 (AMERICAN JOURNAL OF THE MEDICAL SCIENCES, 1839, xxvi. p. 506), under the title, "A Case of Mollities Ossium." The patient was a married woman of forty-three, the mother of five children, eighteen months past the menopause, living in Webster, Mass. The disease lasted two years, during which time the bones became so soft as to be easily bent. Autopsy showed changes similar to those of osteomalacia.

In 1861 W. H. Lamme, of Centreville, Ohio, reported "A Case of Mollities Ossium" (*Cincinnati Lancet and Observer*, 1861, vol. iv. p. 215) in the person of a married woman of sixty-three, the mother of several children. Illness lasted for ten years, with progressive deformity and softening of the bones of the lower extremities and severe pains. The bones were "as soft as bags filled with hair." No autopsy.

N. Dalton reported a case seen in Ohio, in 1860 ("Arrest and Cure of a Case of Mollities Ossium by the Use of Phosphate of Lime and Phosphoric Acid," *Trans. Ohio Medical Society*, Cincinnati, 1863, xviii. p. 67). The patient was a female, seventeen years old, unmarried. She was ill two years, with progressive softening and deformity of the bones of the pelvis, ribs, clavicles, cranium, and legs, with intense pain and spontaneous fractures. In this case the urine contained "a large quantity of whitish-gray deposit equal to one-third of its volume." Dalton found this urine contained over eleven grains of earthy phosphates in two ounces. Under the treatment indicated in the title the bones became solid and the excretion of lime ceased.

Joseph Jones has reported the case of a white girl who died at eighteen years with a condition resembling osteomalacia (*Medical and Surgical Memoirs*, by Joseph Jones, New Orleans, 1876, vol. 1). The patient lived for a time on an island in the Ohio River in extreme poverty and most unfavorable hygienic conditions. From the age of five there was progressive softening of the bones, with great pain.

Bolles reported a case of "Remarkable Fragility of Bones" (*Boston Medical and Surgical Journal*, 1871, vii. p. 181), which was probably one of osteomalacia. The history is incomplete. Multiple fractures from slight causes, with union and breaking down of callus, were observed for two years after the menopause in a married woman of forty-six.

The word osteomalacia first appears in connection with a case reported by Ellis in 1878 (*Boston Medical and Surgical Journal*, 1878, xcviii. p. 5). This was the case of a man of fifty, who died after an illness of ten months' duration, with fractures, pain, etc. It does not seem certain that this was a case of osteomalacia, though the reporter could find no evidence of "cancer, caries, or leukæmia."

In 1883 Stone reported a "Case of Osteomalacia with Autopsy" (*Boston Medical and Surgical Journal*, 1883, cix. p. 220). Married woman of fifty-five years, mother of six children, had rheumatic pains, followed by progressive softening of bones, with fractures and deformity, lasting four years. Autopsy showed characteristic changes.

In 1887 Lamb, of Washington, reported a case of osteomalacia (*Journal of the American Medical Association*, 1887, viii. p. 493). Woman aged sixty-eight, single. Ill twenty-one years, with extreme pain in legs, weakness, "drawing-in pains," softening and deformity of bones. Autopsy.

Wheaton reported the case of a single woman of thirty (?), still living at the time of the report, who for four years had softening of the bones with deformity and fractures. The urine was sometimes milky, containing an excess of phosphates (*Northwestern Lancet*, 1891, p. 389).

Wheaton refers to a case in the care of Dr. Briggs, of St. Paul, which does not seem to be reported otherwise.

Woman of thirty-five years, married. After the birth of her fourth child softening and deformity appeared in the spine and pelvis. Ovariotomy was performed, but the disease continued to progress.

The case of French (*Northwestern Lancet*, 1891, p. 413) does not seem to be one of osteomalacia, but rather of malignant disease. The case of Russell (*Cleveland Medical Gazette*, 1892, vii. p. 471) also seems doubtful.

Finally, in 1892, Lamb gave the history of a case, the bones of which are in the Army Medical Museum (No. 10,010) (*Journal of the American Medical Association*, 1892, xviii. p. 188). Female, single, aged sixty-nine years. Following acute arthritis there were progressive deformity and softening of the bones, lasting twenty-six years. The autopsy showed traces of old pelvic inflammation.

Excluding the doubtful cases of Ellis, French, and Russell the total number of those reported is only ten; all of the cases were females and whites.

Three of the cases occurred in Massachusetts, two in Ohio, one on an island in the Ohio River, two in Minnesota, one in Virginia, and one in the District of Columbia. All the patients seem to have been of American birth.

Almost nothing is said of the family history. In four cases the environment is not mentioned; in three cases it was considered good. One lived in great poverty on a low island subject to overflow; another lived very sparingly; and in the third the disease began after a period of exposure and privation while nursing in the army.

Concerning the previous history of the cases very little is said. In four it was stated to have been good; one was chlorotic; another had prolonged malaria; and several had histories of rheumatism or arthritis aside from that connected with the disease. In five of the cases the subjects were single and had borne no children. In four the disease began after the menopause; all of these cases had borne children with apparently normal deliveries and recoveries, all of them having large families—five to ten children. The one puerperal case occurred at the age of thirty-five after the birth of the fourth child. In the chlorotic patient the disease seemed to increase in severity at the time of the menstrual flow; in the case of Jones, menstruation was long delayed and only established under treatment.

The duration of the disease varied from two to twenty-six years. The longest duration was observed in the oldest cases. Four of the cases were living at the time of the report; in three of these the disease had lasted about two years; in the other the duration was not given. Of the 7 fatal cases 1 lasted two years, 2 four years, 1 ten, 1 thirteen, 1 twenty-one, and 1 twenty-six. During the greater part of these periods the patients were helpless in bed.

In all cases the disease began with rheumatic pains, so that a diagnosis of rheumatism was usually made; in one case the diagnosis was influenza. The intense and deep-seated pains began usually in the lower extremities, and in all but one case form a striking feature of the disease. These pains are described as "crushing," "drawing," etc., and were increased during bad weather. Associated with the pains were progressive weakness; fractures from slight causes, usually not uniting; increasing softness and deformity of bones; and finally complete helplessness. Appetite and digestion were usually good; in one case obstinate constipation; the mind remained clear, and nervous symptoms were not marked. In three of the cases dyspnœa from pressure upon the thoracic organs was prominent as a late symptom. Death occurred usually from exhaustion.

The condition of the urine is mentioned in but five cases; in one it was said to be normal; in three increased in amount and depositing a greatly increased sediment of phosphates, in one case one-third of the volume; in the other case it was "loaded with urates" (?).

The blood was not examined in any of the cases.

In four cases only was an autopsy held. In all of these there were great deformity of the bones, atrophy and fatty degeneration of the muscles. The bones of the extremities, pelvis, and spine were so softened as to be easily cut or crushed; in some places bone was completely absorbed and no trace of it found. The compact portion was greatly thinned and softened, the medullary spaces widened and the marrow increased, dark-red "like coagulated blood," easily cut, consisting of "blood-cells and vessels," "fat-cells and free fat," or of "plates and fibres loosely held in a whitish mass of fat or gelatinous matter;" some portions filled with "liquid fat."

No tests were made for lactic acid in the bones or urine.

In one case the ovaries were normal, in two they were atrophied, and in one case not mentioned.

In two cases small calculi were found in the kidney.

This summary shows that the general features of osteomalacia were present in these cases, although they differ in many respects from those observed in other countries. Gelpke, in his monograph on the *Osteomalacia in Ergolzthal*, near Basel (Basel, 1891), states that in countries where osteomalacia is not endemic the non-puerperal forms are seen more frequently than puerperal cases, a point which Ribbert ("Anatomische Untersuchungen über die Osteomalacia," *Bibliotheca Medica*, Cassel, 1893) questions, but which the cases so far reported in this country seem to bear out.

A CONSIDERATION OF THE VASCULAR MECHANISM OF THE NASAL MUCOUS MEMBRANE AND ITS RELATIONS TO CERTAIN PATHOLOGICAL PROCESSES.

By Jonathan Wright, M.D.,
of Brooklyn, L. I.

The blood supply to the turbinated bodies possesses an interest for the rhinologist due largely to the bearing its proper appreciation has upon his comprehension of the pathological lesions and clinical phenomena in the various arbitrary divisions of rhinitis. Whatever may be the exact anatomical inter-relation of arteries, capillaries, veins, and venous sinuses, it is evident that they cannot overcome the elastic resistance to their dilatation without some arrangement for checking the venous return. There are no specially adapted muscles to compress a few veins, as in the penis; there is no tunica albuginea to exert compression.

In studying the subject it will be necessary to describe shortly the vascular anatomy of the turbinated bodies. Zuckerkandl has rendered this task a comparatively easy one.

The larger arterioles well supplied with muscular coats lie in the deepest layers of the mucous membrane close to the bone. They give off branches which supply, by a network of capillaries, the periosteum, the glands, and the epithelial layer of the mucous membrane. These capillaries are collected into the veins, which dilate into venous sinuses, the larger lacunæ of which are the deeper, the superficial lacunæ or "cortical network" communicating with them. These lacunæ again empty into the veins which accompany the primary arterioles into the periosteal layer.

Zuckerkandl says he has never seen the arteries emptying directly into the venous sinuses. The same was said for a long time of the corpus cavernosum of the penis, but they were finally conclusively shown to do so, and I am not convinced that this does not occasionally take place in the erectile bodies of the nasal mucous membrane, though I have thus far been unable to trace the connection between the two.

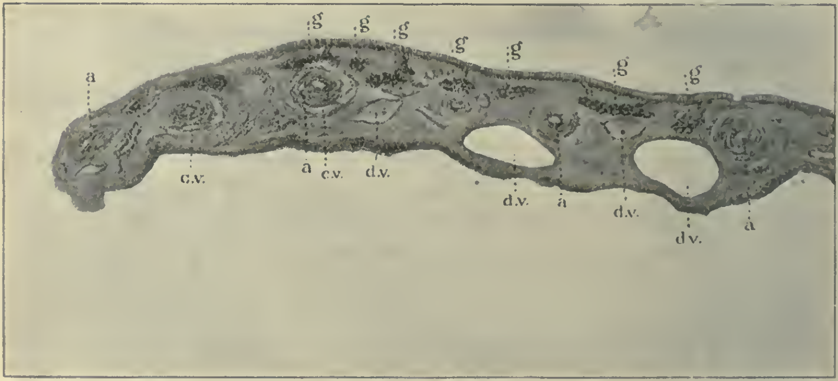
The capillaries, usually at least, do not empty directly into the venous sinuses nor into the radical veins accompanying the arteries. They are usually seen collected first into veins. The smaller veins of the periosteal layer empty directly into the radical veins accompanying the arterioles.

It is a matter of the greatest difficulty in this country, even in New York, to obtain adult heads fresh enough post-mortem, which may be opened and the nasal mucous membrane removed for microscopic study. Infants, stillborn or dying shortly after birth, may be easily obtained, but the erectile tissue (the venous sinuses) does not develop fully until near the time of puberty. It is possible in the "dead-house" to saw off the inferior turbinated bones through the nostrils in adult subjects, but in this climate the microscope will usually reveal a pathological condition of the mucous membrane. In animals the vascular arrangement differs in many respects from that of man. The sheep has no erectile tissue. The calf has cavernous sinuses on the posterior border of the septum which more nearly resemble the corpus cavernosum of the penis in having a thick external tunic and no muscle-fibres in the walls of the sinuses.

Nevertheless, by comparing all these different conditions the probable mechanism of the blood-supply in the highly evolved nasal mucous membrane of man becomes pretty evident. The radical arteries and veins pass through various bony canals into the nose, as the large spheno-palatine foramen and smaller foramina in the ethmoid. The artery will evidently compress, when dilated, its accompanying vein against the bony walls, thus letting in more blood and limiting the outflow. Contraction of the artery acts in the inverse sense. This arrangement has been described for the blood-supply of the marrow of the long bones.

There is a similar mechanism, as the arterial branches with their veins lie in the deep or periosteal layer of the mucous membrane.

Fig 1.

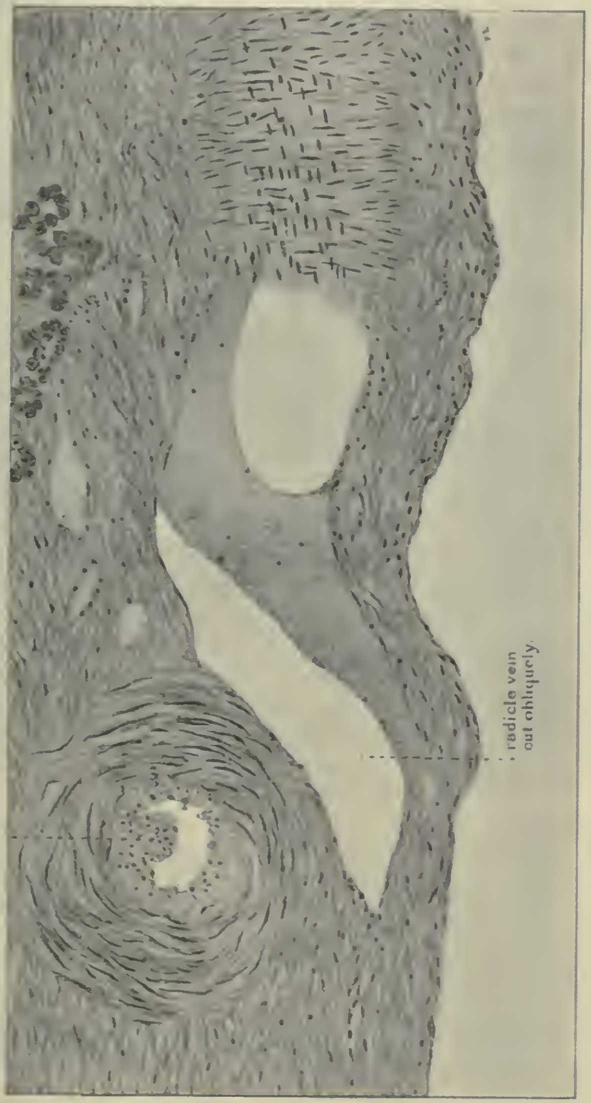


Nasal mucous membrane of sheep. × 10
a. Artery. g. Gland. d.v. Dilated vein. c.v. Closed vein.

Fig. 1 shows very clearly how this occurs in the sheep. You will observe that many of the large veins lie between the very muscular arteries and the firm periosteum at the level of this particular section. Of the thirty or forty sections examined, this arrangement was evident in so many pairs that it is fair to presume that at some one or more points each radical artery and vein stand in such a mutual relation that an increase in the diameter of the artery must result in an encroachment upon the lumen of the vein without entirely closing it. While this drawing is from the mucous membrane of the sheep, the same arrangement, by careful study, will frequently be found in that of man; but, owing to the very much more complex and irregular course of the vessels, it does not present such a striking and convincing illustration.

There is such a complete anastomosis of the superficial veins with one another, with those of the skin at the edge of the nostrils, with the veins of the dura mater and of the orbit, that this obstruction to the venous return probably exerts its dilating tendency only or chiefly upon the *deep* network of the erectile bodies. It does act, however, upon them

FIG. 2.



Deep layer of nasal mucous membrane of sheep. × 300.

as the supply and escape valve to the cavernous sinuses, and stands in the place of the muscles which compress the radical veins of the penis. As Zuckerkandl has said, after a study of the microscopic structure of the nasal mucous membrane, one is impressed with the large amount of muscle-fibre with which its various elements are supplied. The walls of the larger arterioles are very thick, while some vessels with lumina no larger than those of the larger capillaries are supplied with well-developed circular muscle-fibres. Still more unusual is the amount of muscular tissue in the walls of the veins. In Fig. 2, from the same series of sections as Fig. 1, you will see a high-power drawing of a radical vein which happens to be cut obliquely so as to show perfectly its circular fibres. Comparing them with those of the adjacent artery, which is cut more squarely across, you will observe that they are very much more scanty, but, nevertheless, sufficiently plentiful to exert considerable influence upon the lumen of the vessel. As you look at this drawing the question will arise whether the contraction of the muscle-fibres of the vein is synchronous with those of the artery. You will observe that the artery, even in its contracted state, encroaches on the walls of the vein, which is evidently dilated, as are many of the veins in Fig. 1.

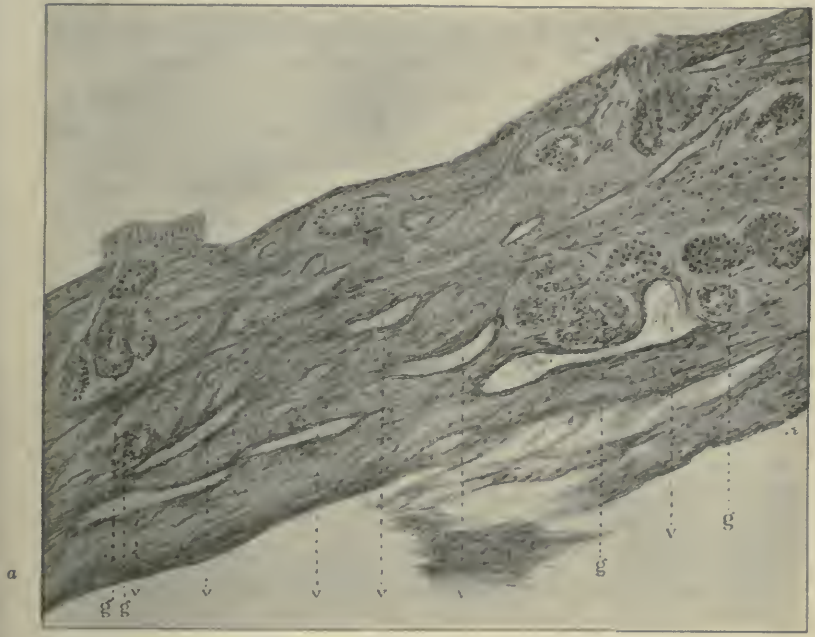
This is a point which, while very interesting, is not as yet clearly explained by the physiologist. Even if they do contract and dilate synchronically, the pressure of the dilated artery would sufficiently narrow the lumen of the relaxed vein. In contraction of the artery, on the other hand, the venous fibres would tend to prevent the excessive dragging apart of the venous walls and the over-engorgement of the vein. In man we have these same muscular veins receiving the blood from the venous sinuses, the walls of which are themselves plentifully supplied with muscle-fibres. The areolar tissue in the neighborhood of veins and venous sinuses is also in man more or less plentifully supplied with muscle-fibres. This richness in muscle-fibre is the arrangement which supplies the place of the tunica albuginea of the penis in driving the blood out of the tissues when the gateways of the radical veins are opened.

Before leaving this part of the subject I cannot refrain from wandering a little into the domain of pathology. The venous sinuses, as we have seen, depend largely for their expulsive power upon their muscular walls. Now we find in chronic rhinitis the walls of these vascular spaces very much thickened by the overgrowth of non-elastic fibrous tissue of a low grade of development. This must manifestly interfere with efficient contraction of the muscle-fibres. In the hypertrophy of these bodies we have, therefore, not only a dilatation of the lacunæ but a paresis of their walls.

Atrophy evidently has ordinarily, as its antecedent, the gradual elimination of the muscular element and the encroachment upon the vascular spaces by this fibrous hyperplasia, which itself finally becomes to some extent absorbed, leaving as a thin covering to the shrunken turbinated bones a membrane deprived of its two essential elements, the glands and the venous sinuses.

Usually, however, this process is arrested before it reaches these extreme limits. Is it not reasonable to conjecture that we may find in this an explanation of the cause of atrophic rhinitis apparently beginning in so many cases about the time of puberty? This fibrosis, beginning in childhood as the result of inflammation of a low grade, must tend to prevent the development, at or near puberty, of the venous sinuses. For it is probable that, normally, this ectasia of the bloodvessels, resulting in the formation of the nasal erectile tissue, is accomplished by engorgement due to the excitability of the sexual apparatus at that time. This does not explain all the phenomena of this puzzling nasal affection, but it gives us a hint that may be amplified into more satisfactory knowledge by the study of the life-history of the glands of the nasal mucous membrane from infancy to old age. By the use of the cautery in the hyper-

FIG. 3.



Nasal mucous membrane from septum of infant. × 50.
a. Periosteal layer. v. Radicle vein. g. Gland.

trophy of the erectile bodies we destroy some of the vascular spaces. We do not restore the efficiency of the muscular apparatus; on the contrary, by inducing the formation of the scar we favor the tendency to fibrosis. This is evidently the reason we occasionally see marked atrophy of the mucous membrane after cauterization and other intranasal operations.

To return to normal histology: There is still another element which is apparently important in the mechanism of the blood-supply. In Fig. 3, a drawing taken from a section of an infant's nasal mucous membrane, you observe veins compressed between the parallel fibres of the periosteal layer and the elastic fibres and glands external to it. It becomes evident here, as in the case of the radical artery and vein, that engorgement of the superficial tissues supplied by dilated arterial twigs will bring an increased pressure to bear against the vein and obstruct the outflow of blood. Where this arrangement is most marked, as it is in many places on the septum, we miss the abundant muscular element in the walls of the veins. A certain amount of elastic pressure is here always present, but it is increased by the results of arterial dilatation.[1]

In the distribution of the capillaries to the surface and to the glands, the endothelial wall of the capillary is in close apposition to the epithelium of the surface and of the glands. Free nuclei may frequently be seen passing through the epithelial layer. This is especially noteworthy in the so-called olfactory region. The nuclei having no power of locomotion when deprived of the cell-body, but being simply recognizable cell-detritus, we must suppose that they are carried by the exudation of the watery part of the blood.

We may, therefore, get a transudation of serum to the surface directly from the vessels, especially in the olfactory regions, without necessarily the intervention of the glands.

This brings us to another point. Zuckerkandl has lately described a special network of small veins so surrounding the mouths of the glands that their engorgement would necessarily close the glandular conduits.

Now these two points make a certain clinical phenomenon clear to us. The first stage of a coryza, after the somewhat problematical one of vascular contraction, is that of vascular engorgement of the erectile bodies leading to nasal occlusion. Now, with the bloodvessels all full, and with the stimulation of the glands, we should expect the secretion of mucus to be discharged almost coincidently with the congestion. As a matter of fact, we all know that for the first few hours even watery secretion is scanty, and for the first few days the discharge consists very largely of nearly clear serum. It only begins to thicken with mucus when the vascular tension relaxes. Evidently, then, the congestion of these veins encircling the glandular outlets must close the latter and prevent the escape of their contents. The watery secretion of the first stage we could account for by transudation directly from the bloodvessels through the areolar tissue and the surface epithelium.

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[1] It is singular that by far the greater number of growths on the septum are so-called angeiomata. They probably have their origin in chronic rhinitis, which has resulted in a dilatation of the bloodvessels.

The contraction of the smooth muscle-fibres and of the elastic fibres of the stroma contributes to the collapse of the venous sinuses, the gateways of the radical veins being opened by the contraction of the encroaching arterioles. An expression of the glandular contents also follows, subsidence of the engorgement of the superficial veins having opened the mouths of the glands.

THE VALUE OF OPHTHALMOSCOPIC CORNEAL IMAGES.

By Ernest E. Maddox, M.D.,
of Edinburgh.

In my previous paper on this subject it is said that the corneal reflection maps out with very fair precision the point of the cornea which is traversed by the visual axis.

This is true enough for practice, but requires qualification from a scientific point of view, for the precision is not absolute, and it remains to set the discrepancy on a definite basis.

The symmetry of the eyeball, though for a living organ truly marvellous, is not perfect, since the centres of curvature of its media are not in a mathematically straight line; yet they are sufficiently so to allow us to speak of an "axis of symmetry," in, or close to which each centre resides. The two extremities of this "optic axis" are the anterior and posterior poles of the eye, of which the former is the "summit," or mid-point of the cornea, a point equidistant from opposite parts of its circumference.

Before proceeding further, the shape of the cornea will require a little consideration. Its horizontal diameter is greater than its vertical, and even when free from astigmatism its shape is very peculiar, being evidently adapted to abolish spherical aberration. It is generally described as an "ellipsoid of revolution," the long axis of which is tilted at a slight angle with the optic axis.

Sulzer,[1] however, has shown, by very careful measurements, that we may consider the cornea for a considerable area around the visual axis as approximately spherical, while only outside this area does it become ellipsoidal, and increasingly so toward the periphery. Since, in the methods of using corneal images which I have advocated, the centre of the ophthalmoscopic mirror is always made the point of fixation for the patient, the corneal reflection takes place quite close to the visual axis, and therefore within the area which is spoken of by Sulzer as spherical.

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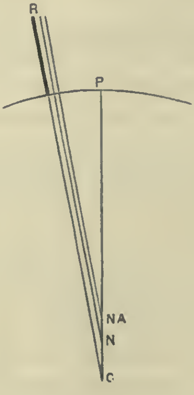
[1] La forme de la cornée humaine, 1892.

We may feel quite free, therefore, without danger of appreciable error, to regard the portion of the cornea concerned in our test as if it were an absolutely spherical convex mirror, with a radius of curvature of about 7.8 mm.

Since the focal length of every convex mirror is half its radius of curvature, the principal focus of the cornea lies nearly 4 mm. behind its anterior surface, or almost exactly in the plane of the pupil. The corneal image is, of course, a virtual one, since the light does not really reach it, but is only reflected from the cornea as if it came from it.



Now let us imagine two straight lines, one (shown in the figure as C R) drawn from the centre of curvature (C) of the cornea, and the other drawn from N, which is the anterior nodal point; both meeting in the eye of the surgeon, and therefore nearly parallel. The first (C R) is the line which determines the position of the bright reflection from the cornea; it is around this line that the corneal image lies, at a distance of about 4 mm. behind the anterior surface of the cornea, and it, of course, coincides with the surgeon's visual axis when he looks at the corneal reflection. The other line, from N, is the patient's visual axis. Were the anterior nodal point and the centre of curvature of the cornea to coincide, the two lines proceeding from them would also coincide.

In that case the corneal reflection would map out the patient's visual axis with absolute precision. But, in fact, they do not coincide, as shown in the figure, the anterior nodal point being only 6.968 mm. behind the cornea when accommodation is negative, and further forward still when accommodation is positive. When, as sometimes occurs in high myopia, the patient's visual axis coincides with his optic axis, then the line of the corneal reflection also coincides with both, and the corneal reflection itself occupies the exact mid-point of the cornea. Under these circumstances alone does the corneal image exactly indicate the part of the cornea traversed by the visual axis. Under all other conditions the corneal image *exaggerates* the inclination of the visual axis by a definite ratio, the amount of which depends on the relative distance, behind the anterior surface of the cornea, of the anterior nodal point and of the centre of curvature.

The ratio between these two distances is, with negative accommodation, as 8 to 9, and with the fullest possible accommodation, as 5 to 6.

In the figure, N represents the nodal point in negative accommodation, and N A the same nodal point with fullest possible accommodation, and the lines drawn from each show that the exaggeration is greater during full than during negative accommodation. The corneal reflection, therefore, exaggerates the obliquity of the visual axis by at least one-eighth as much again. This, however, is very slight, and, being regular and in perfect ratio, only suits our purpose for clinical use all the better.

TUBERCULAR TUMORS OF THE LARYNX.

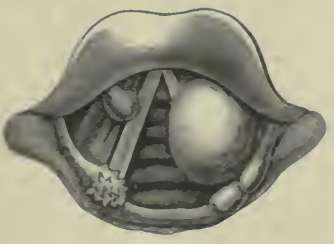
By J. Payson Clark, M.D.,
of Boston, Mass.;
Physician for Diseases of the Throat, Massachusetts General Hospital.

It is not my intention in this paper to discuss the usual manifestations of phthisis laryngis. Tubercular infiltrations of the epiglottis, the arytenoids, and the inter-arytenoid space, and the masses of granulation-tissue often resembling papilloma springing from tubercular ulcerations are characteristic appearances familiar to all who have occasion to examine the larynx frequently. These appearances, although they may be considered in a sense tumors, do not come under the title as it is here applied. Tubercular disease of the larynx appears, very rarely, to manifest itself in the form of smooth, rounded tumors, single or multiple, or in the form of papillomatous growths which are found, on microscopic examination, to consist of tubercular tissue containing generally the bacilli of tuberculosis, and accompanied often by no or only slight manifestations of pulmonary tuberculosis. All such cases, as far as I know, which have been published I shall briefly review, bringing out only the important points, report a case of my own, and endeavor to draw some conclusions which may be of value.

As early as 1866 Tobold appears to have recognized the existence of tubercular growths of the larynx, although Ariza (1877) is generally considered as having been the first to call attention to them. In the case reported by the latter there was a tumor of the epiglottis which, on removal and microscopic examination, was found to be tubercular. Recurrence was rapid. E. F. Ingals mentions a case in which there was a distinct tumor, size of a split-pea, springing from the right arytenoid. There was evident pulmonary tuberculosis. The microscopic nature of the growth was not ascertained.

J. N. Mackenzie reports two cases observed *post mortem:* (1) Tumor of trachea, about 1½ cm. above bifurcation; dense, smooth, size of bean, covered with mucous membrane, and consisting microscopically of tuberculous nodules. There were tubercular cavities in the lungs. (2) Whole upper compartment of the larynx presented a mammillary appearance, due to the presence of small, smooth, dense nodular growths under the intact mucous membrane, microscopically tubercular. There were tubercular cavities in the lungs. Gussenbauer's case was a man, aged twenty-four years, suffering from dyspnœa and aphonia caused by a tumor of the larynx. A diagnosis of carcinoma (supported by microscopical examination) was made, and total extirpation of the larynx was performed. The patient died several months later, of pulmonary tuberculosis. Another histological examination of the tumor showed it to have been tubercular. Schnitzler reports three cases: (1) A young man had cough for a long time, hoarseness for several months, dyspnœa for a few weeks. The larynx contained numerous growths (size of a bean to that of a hazelnut), grayish-white, not ulcerated, arising mostly from the ventricle, and almost filling the larynx, having the appearance of a papilloma. Tracheotomy was performed for dyspnœa. The tumors were removed with the guillotine and found to consist microscopically of a collection of miliary tubercles; cure. (2) Man, aged forty years, with pulmonary phthisis. Larynx healthy, except a grayish-white tumor size of hazelnut from the posterior tracheal wall. Tracheotomy; death. No autopsy mentioned. (3) Patient with pulmonary phthisis; had a number of smooth, non-ulcerated tumors springing from the ventricles. No further details were given. Lermoyez's case was a man, aged forty years, having an enormous polypoid growth on the right vocal cord, causing attacks of suffocation for which tracheotomy was done; death. Autopsy showed tubercular infiltration of both lungs. Percy Kidd has reported four cases: (1) Male, aged fifty years, had winter cough for two years; for eight months increase of cough, with hoarseness and dyspnœa. Consolidation at left apex. Larynx contained a pea-sized, smooth, rounded tumor arising from the angle between the arytenoid cartilage and the ventricular band. A symmetrical tumor gradually appeared on the right side. Marked signs of pulmonary phthisis developed, from which the patient died eight months later. The tumors consisted of an aggregation of miliary tubercles containing numerous tubercle bacilli. (2) Male, aged thirty-seven years, had cough for one year with expectoration, and a few months later hoarseness and dysphagia. Physical signs of phthisis present in both lungs. There were ulcerations in the larynx and a tumor on the right aryepiglottic fold size of a small cherry, sessile, smooth, yellowish-white, and studded with bright-red points. Tumor was not removed, and became ulcerated later. The patient was lost sight of. (3) Male, aged thirty-two years, had cough for fourteen months, with expectoration and hoarseness; phthisis in both lungs; ulceration in pharynx and larynx. Patient died of phthisis pulmonalis. Grayish-pink tumor, size of pea, consisting of groups of miliary tubercles, grew from posterior laryngeal wall. (4) Male, aged twenty-three years, with family history of phthisis; had pulmonary phthisis for two years. The epiglottis was ulcerated, with other signs of laryngeal tuberculosis. A smooth tumor, size of a small bean, sprang from the under surface of each ventricular band. Microscopic examination of one tumor showed it to be tuberculous. Foà found a small arborescent vegetation at the base of the epiglottis and on the vocal cords in the larynx of a woman who died of pulmonary phthisis. The growth contained giant cells and numerous tubercle bacilli. M. Schaeffer and D. Nasse report the case of a man, aged thirty-three years, hoarse for several months. A tumor grew from the arytenoid region, and covered the posterior third of the left vocal cord. It was the size of a bean, irregular but smooth, and was removed with cold wire-snare. There were physical signs of phthisis at right apex and bacilli in sputum. The tumor was found to be tuberculous on microscopic examination. The patient died in about one year, of phthisis. Dehio's case was a man, aged forty-one years, with no tubercular or syphilitic symptoms, with intermittent hoarseness for over a year and dysphagia for several months. There were no signs of lung-trouble. A tumor of the left ventricular band almost concealed the left vocal cord, and was removed by laryngotomy as malignant. It was found to be tubercular, containing giant cells and tubercle bacilli. The patient died seven weeks later, of pulmonary tuberculosis. Arthur Hennig's case is interesting: Male, aged fifty-two years, heavy drinker; no heredity; had been hoarse for twelve years. When examined was suffering from attacks of coughing, with dyspnœa and aphonia. There was dulness at right apex, prolonged expiration, and moist râles. There was a tumor, size of a filbert, covered with apparently normal mucous membrane concealing the posterior two-thirds of the left vocal cord and apparently arising from the left ventricular band. A smaller growth was over the right ventricular band, and on the right arytenoid a small condylomatous growth. (See Fig. 1.) The larynx was otherwise normal. Laryngotomy was performed, the tumors removed with the Paquelin cautery, and the right arytenoid cauterized. The growths were microscopically tubercular. The patient's condition was good for two weeks; then cough began, with profuse expectoration. An abscess formed in the neck, and the patient died thirty-seven days after the operation. The autopsy showed extensive chronic tuberculosis of both lungs, the left ventricular band ulcerated away, and an ulcer at the site of the smaller tumor. Gougenheim and Tissier's case was a young man. At

FIG. 1.



Hennig's case.

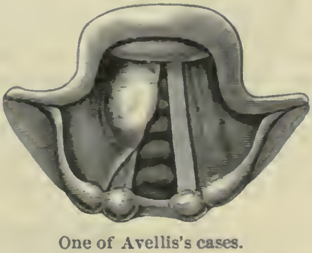
the base of the epiglottis there was a lobulated tumor nearly filling the larynx, causing increasing dyspnœa and necessitating tracheotomy. Lungs were apparently negative. The laryngeal growth was removed by forceps, and found to be tubercular. After two years the tracheotomy tube was removed. Patient's general condition remains satisfactory.

J. B. Marty's case was a man, aged thirty-two years, showing a reddish, firm, pedunculated tumor of the right ventricular band. He had been hoarse for seven years. The lungs were tubercular. Under treatment with the galvano-cautery, after unsuccessful attempts to remove it with forceps, the tumor disappeared. Cartaz reports three cases: (1) Woman, aged thirty-three, no heredity; general health good, was hoarse for two and a half months. The vocal cords were found slightly reddened without ulceration, and a rounded reddish-gray tumor, the size of a small hazelnut, in the posterior third of the right vocal cord. This was removed with forceps and found to contain granulation-tissue, giant cells, and numerous bacilli. A month later there was an ulcer at the site of the growth, and the vocal cords were infiltrated and ulcerated. The lungs soon showed signs of phthisis, of which the patient died a year later. (2) Man, aged thirty-five, became hoarse after an attack of bronchitis. Grippe some months later aggravated the hoarseness. A grayish-pink tumor the size of a pea was visible on the anterior part of the left vocal cord. Both cords were red and thickened. There was prolonged expiration at right apex. Fragment of tumor removed for examination was lost. The patient died of hæmoptysis six months later. (3) Young woman with tubercular antecedents had cough and hoarseness for one year. A grayish-red conical tumor was seen in posterior commissure of larynx, which was otherwise normal. Dulness and prolonged expiration were found at right apex. The tumor was removed with forceps, and consisted of granulation-tissue containing giant cells and tubercle bacilli. Arpad A. Gerster's case was a man, aged twenty-nine, with physical signs of phthisis for a number of years, with dysphagia for nine months, and later increasing dyspnœa and hoarseness. In the larynx was a tumor of the size and shape of an almond, smooth, and covered with apparently normal mucous membrane occupying the posterior half of the left arytenoid and ventricular band, almost concealing the glottis. After thyrotomy the tumor, with part of the left vocal cord and arytenoid, was removed. The wound healed by first intention, but two and a half months later a tuberculous fistula formed, and the lungs grew worse. The tumor was microscopically tubercular.

Dundas Grant's case: Man, aged twenty-eight, hoarse for six years following laryngitis; had a pedunculated growth from the right vocal cord and a sessile growth in the inter-arytenoid space. The epiglottis was red and œdematous, also the ary-epiglottic folds and the vocal cords. There were ulcers on the right vocal cord and ary-epiglottic folds, but no physical signs of phthisis pulmonalis. The patient died of asphyxia. Coexisting pulmonary disease was found. Microscopic examination of growth is not mentioned.

Avellis has written a very thorough article on this subject. He reports thirteen cases from the clinic of Moritz Schmidt in Frankfort. I have verified all but a few of his references, and have found his paper of great assistance in preparing my own. The following are brief abstracts of his cases: (1) Man, aged twenty-five, was hoarse for several months. In the larynx was a smooth, red growth, size of half a split pea, from under surface of the right vocal cord, having the gross appearance of a fibroma. On removal and microscopic examination it was found tubercular. Six months later there were serious tubercular changes in the larynx, and three months after this the first evidence of phthisis in both apices was discovered. (2) Woman, aged forty, had tumor covered with normal mucous membrane growing from right ventricle. Lungs were apparently normal. Tumor was removed with curette and lactic acid applied. Growth found microscopically tubercular. A year later the larynx was normal. (3) Man, aged thirty-two, hoarse one year, had a polyp on anterior third of right vocal cord; removed with forceps and found tubercular. Larynx was otherwise normal. Seven months later there were ulcerations in the larynx and evident tuberculosis of lungs. (4) Woman, aged nineteen, hoarse nine months, had red, smooth tumor of ventricular band almost covering right vocal cord (see Fig. 2), beginning ulcer on the posterior laryngeal wall, and signs of phthisis at right apex. The greater part of the tumor was removed with laryngeal forceps. The rest gradually disappeared and the ulcer above mentioned healed. Later signs of phthisis developed in the left apex, the general condition grew worse and the tumor recurred. This was removed. The patient was lost sight of. (5) Woman, forty-five years of age, hoarse for six months; showed a reddish-gray cauliflower growth under anterior part of glottis and phthisis in both apices. Tumor removed with forceps and found microscopically tubercular. One year later tubercular ulceration appeared in the larynx. Tracheotomy was required for great subcordal swelling. (6) Does not seem to belong to this group, and is omitted. (7) Man, aged thirty-three years, had for a year previous phthisis at both apices. In larynx was a nodulated growth covered with mucous membrane, rising from the right ventricle and almost covering the right cord. This was removed with the galvano-cautery loop. The wound healed. Six weeks later there was infiltration of the ary-epiglottic folds and ulceration of the epiglottis. Three months later the patient died of phthisis pulmonalis. (8) Man, aged eighteen years, had in larynx two tumors size of pea in the left ventricular band, found to be tubercular on microscopic examination. The larynx was otherwise normal. Lung-symptoms first appeared four months after the growth was seen. (9) Man, aged twenty-seven years, had dry pleurisy for two years, hoarse for two months. Left apex infiltrated. Tumor on anterior part of right ventricular band, partially removed with forceps and found tubercular. Three months later there

FIG. 2.



One of Avellis's cases.

was no sign of the tumor. Patient had another attack of pleurisy, and was lost sight of. (10) Woman, aged twenty-three years, hoarse for three months, had tumor under left vocal cord. A piece removed was found tubercular. Dulness and râles at left apex. (11) Man, aged twenty-four years, hoarse three months, had tumor size of half a pea on anterior part of right ventricular band. Larynx otherwise normal. Dulness at right apex, tubercle bacilli in sputum. Tumor removed, but swallowed by patient. (12) Woman, aged fifty-one years, cough for many years, hoarseness two years; had for six weeks dyspnœa and dysphagia. Occasional râles, but no dulness in lungs. Smooth tumor with broad base on left vocal cord removed with cold wire snare, and found tubercular (giant cells and bacilli). (13) Woman, aged nineteen years, with slight pulmonary phthisis; had some hoarseness caused by a tumor of the ventricle, and ventricular band covering half the vocal cord. Removed with forceps and found tubercular. General condition improved. Larynx sound one year later.

Trêkaki's case was a syphilitic man, aged thirty-five, with no tubercular family history. There was gradually increasing dyspnœa. Laryngological examination was impossible. The lungs were apparently normal. General condition was good, except for slight elevation of temperature. Patient died of sudden asphyxiation. The autopsy revealed a sessile tumor of the left ventricular band almost completely obstructing the larynx. The tumor was a tubercular infiltration of the muscle of the ventricular band. There were tubercular nodules in the trachea. Schwartz reports a case in which there were vegetations in the posterior third of the right vocal cord, which on microscopic examination were found to be tubercular. The patient died later of pulmonary phthisis.

Heryng reports three cases of hemispherical white sessile tumors on the false cords posteriorly. The larynges were otherwise normal. Phthisis of the lungs was beginning. In one case the tumor was removed and found to contain some small tubercles and giant cells.

The case which I have to add to the above is the following: Mrs. F., aged thirty-one years, with no tubercular family history, was first seen by me on May 9, 1893. At ten years of age she had a severe attack of cerebro-spinal meningitis. Since then she has always been well until three years and a half ago (November, 1889), when she took a severe cold from being in a damp house. This cold was accompanied by laryngitis. She has been hoarse ever since. The laryngeal growth was discovered two years ago and numerous unsuccessful attempts made at its removal. The patient did not wish to undergo thyrotomy, which one surgeon suggested as the only way to remove the growth. When first seen by me the patient weighed 120 pounds. She was a small woman, and looked in fairly good condition. She was quite hoarse, experienced some difficulty in speaking, and had occasionally some dyspnœa on exertion. Laryngological examination showed a smooth, sessile, dimpled growth, covered with mucous membrane, somewhat redder than the surrounding, springing from the left ventricular band and concealing during respiration most of the left vocal cord and part of the right. The larynx was otherwise normal except a slight injection of the vocal cords. Fig. 3 gives a fair idea of the relative size and appearance of the growth.

An eight per cent. solution of cocaine was sprayed into the larynx and the growth removed with the cold wire-snare. The instrument used was Hooper's combined snare and écraseur, with a Schrötter tube and No. 4 piano-wire. I was fortunate enough, after only a very few trials at one sitting, to get the loop well around the base of the tumor. After tightening the loop a few turns of the écraseur were required to cut through the firm attachment. When this was done the growth was immediately coughed up. Hemorrhage was very slight. The growth was very firm, having the gross appearance of a fibroma. The wound healed quickly. Fig. 4 shows the appearance of the larynx the day after the removal of the growth. The patient was seen on March 12 and October 1, 1894, when the larynx still looked practically as in Fig. 4. On the later date the patient was in excellent health and weighed 145 pounds. Her voice is clear, but she says it gets tired if she uses it very much. A thorough examination of the lungs was entirely negative. Dr. W. F. Whitney very kindly made a microscopic examination of the growth, and reports as follows: "The sections are from an oval growth of irregular outline, about ten mm. by five mm. in diameter. The bulk of the growth is made up of series of minute nodules, extensively cheesy, and in which are scattered multinucleated bodies (giant cells). These nodules are separated by a zone of round-cell tissue of varying width. Here and there the contiguous edges of the nodules touch, giving thus a clover-leaf outline to the group. This

FIG. 3.

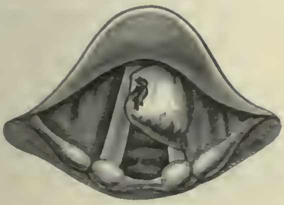


FIG. 4.

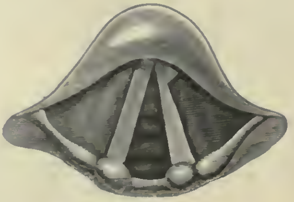
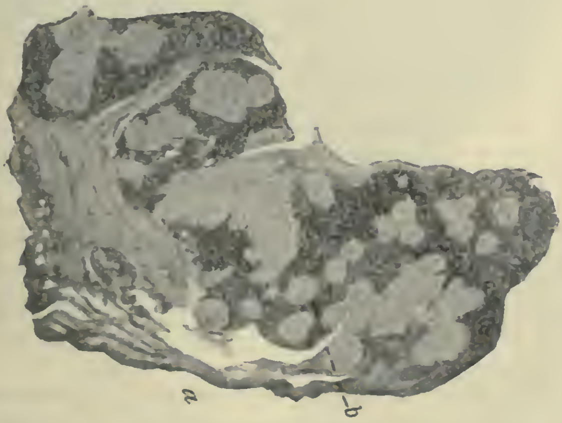


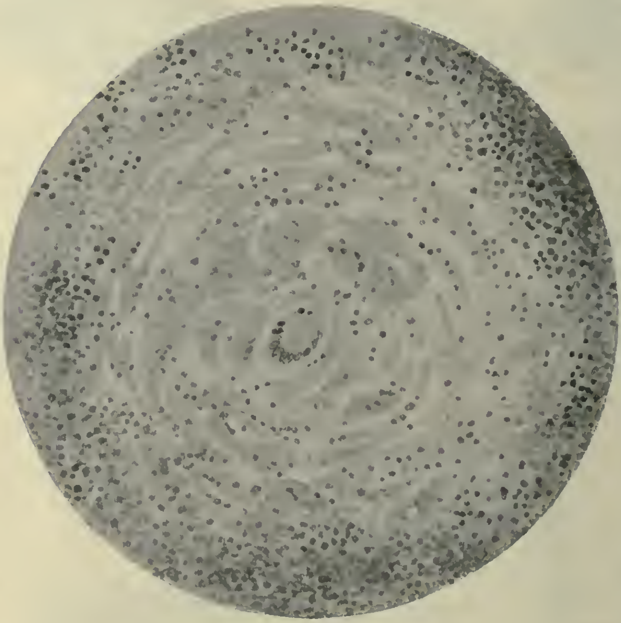
FIG 5.



new growth is covered everywhere, except at one minute point, by a layer of stratified columnar epithelium, which in part lies directly upon it, and in part is separated by a narrow band of connective tissue. This last is very rich in bloodvessels with thick (arteries) and thin (vein) walls. There was also one bundle of nerve-fibres. The growth is a nodule of miliary tubercles growing in a submucous tissue."

Fig. 5 is a low-power enlargement of a microscopic section of the growth. The side bracketed and marked (*a*) was nearest to the surface of attachment. The reason that this side is covered with mucous membrane is that the sections, although perpendicular to the surface of attachment, did not quite reach it, but cut through an overhanging portion of the growth. The portion inclosed in brackets gives a good idea of the diameter of the attached surface. Fig. 6 is a further enlargement of the tubercular nodule marked (*b*) in Fig. 5.

FIG. 6.



I have collected here the reports of 42 cases of laryngeal tumors. Of these, 13 are more or less incomplete; but of the 13 the majority were undoubtedly tubercular tumors. As far as I know, the only other writers who make any reference to the existence of tubercular laryngeal tumors are Mandl, Gottstein, and McBride. Gottstein says: "Tubercular laryngeal tumors are growths rising sharply from their surroundings, either solitary or two or more, rounded, of smooth surface, from the size of a pea to that of a hazelnut, microscopically consisting in part of thick fibrous tissue, in part of tubercles closely grouped. In the tubercles are bacilli." McBride says: "In some rare cases the only manifestation of phthisis laryngea is the presence of *tubercular tumors.*" Schwartz (*loc. cit.*) says: "Sometimes tuberculosis manifests itself under the form of veritable tumors projecting into the larynx, to ulcerate later. When not ulcerated they may be taken for tumors of a malignant nature, if there exist no other signs of tuberculosis."

Of the 29 cases in which the history may be considered practically complete and satisfactory, in 3 the tumor was not discovered until after death. In these 3 cases there was also pulmonary tuberculosis. Only 4 of the patients of whom the age is mentioned were over forty, and only 3 under twenty years of age. The affection is, therefore, more frequently one of middle life. Of the cases in which the sex is mentioned, 23 were male and 9 female. In these two particulars this variety of tuberculosis of the larynx coincides with the disease as it usually manifests itself in the larynx. According to Bosworth, in 500 cases of laryngeal tuberculosis reported by McKenzie, 356 occurred between the ages of twenty and forty; 365 were males and 135 females. In the 26 cases in which the growth was seen during life the lungs were tubercular at the time the growth was first seen in 17. Of the 9 remaining cases, 5 developed signs of phthisis pulmonalis later, leaving 4 in whom pulmonary signs could not be found several months to a year and a half after the removal of the growth. Five of the growths are described as having the appearance of a papilloma, while the others had the appearance already described in the quotation from Gottstein. In 28 cases the tumors were single, while in 6 there were two or more. The tumors were rarely ulcerated, and the mucous membrane covering them had generally a normal appearance. In color the growths vary from a pinkish-gray to a dark-red. They are generally firm, but occasionally soft. As a rule, they are sessile, but they may be pedunculated. Their most common sites are the ventricular bands, vocal cords, and ventricles. They have been also found on the posterior laryngeal wall, the epiglottis, arytenoids, and ary-epiglottic folds, under the anterior commissure, and in the trachea. They are apparently of slow growth, and may run a very chronic course. In many of the cases the tumor was known to have been in existence for a year or more, while in others the history of hoarseness for several months to several years may, perhaps, be taken as a fair indication of the length of time the tumor was in existence. The symptoms are hoarseness, often dyspnœa, and more rarely dysphagia, without pain, as a rule.

Are these growths to be considered primary or secondary? It seems to me that there is more than a strong presumption that they are secondary, a metastatic deposit from a primary focus elsewhere, probably in the lungs. The history of the reported cases would seem to bear out this conclusion: the fact that in most cases physical signs showed the coexistence of pulmonary phthisis, while in others the physical signs developed soon after the growth was seen. In the few cases in which they did not develop a tubercular focus may, nevertheless, have existed, for it is a well-known fact that tubercular foci, which were never suspected during life, are found in the lungs at autopsies. And, finally, the fact that these growths are covered with apparently intact mucous membrane is a strong argument against a direct primary, local infection. Pathologically, these growths are generally made up of round-cell tissue surrounding tubercles, often cheesy, degenerated, and containing giant cells. Tubercle bacilli can generally be found.[1]

These growths may be mistaken for a fibroma, papilloma, or sarcoma. If there is coexisting phthisis pulmonalis, the probability is strong that the tumor is also tubercular. In the absence of pulmonary signs it is practically impossible, without microscopic examination, to make a positive diagnosis. It is more than probable that not a few cases reported as fibromata belong under this head. Indeed, it would seem advisable to examine microscopically all supposed papillomata, although this form of tubercular laryngeal tumor is apparently exceedingly rare. The unimpaired mobility and absence of pain would aid in a differential diagnosis from a malignant growth.

The main indications for operations are dyspnœa and dysphonia. These growths have been treated by various applications. They have been removed *per vias naturales* by means of the cold wire-snare, the forceps, guillotine, and galvano-cautery loop. They have also been removed after thyrotomy. On account of the firm character of these growths forceps are, as a rule, ill adapted to their removal. The best instruments would seem to be the cold wire-snare or galvano-cautery loop. In some cases a previous tracheotomy is required. In some, owing to the shape, size, or position of the growth, thyrotomy is necessary. The use of lactic acid or the galvano-cautery on the site of the growth after its removal, to destroy, if possible, any tubercular tissue that may remain, would seem to be indicated in view of the number of cases in which ulcers occurred after the removal of the growth. The reported cases seem to me to indicate that there is no danger of a reinfection of the organism from the setting free of bacilli from the growth, although there is room for a difference of opinion on this point from the fact that in a few cases the first physical signs of pulmonary tuberculosis developed very soon after the removal of the growth. To my mind this is probably simply a coincidence, the tubercular process, which had probably been slowly going on or resting quiescent for some time in the lungs, first making itself evident to physical examination at this time. Nor was there in any case an acute miliary tuberculosis such as might be expected to arise from a sudden setting free of a number of tubercle bacilli into the circulation. In a few cases the result of operation was brilliant, and in most there was great relief from the local symptoms for a longer or shorter period.

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[1] Dr. J. L. Goodale has kindly made a bacteriological examination of about fourteen sections from my specimen, but with negative results.

In conclusion, I wish to thank Dr. W. F. Whitney for his careful microscopical examination of my specimen, and also for his kind supervision of the microscopic drawings, and Dr. W. D. Hall for preparing and mounting the microscopic sections.

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PALMUS.[1]

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IT has been my fortune in the last few years to see a number of cases of muscular movements to which the French authors have given the name of *Tic Convulsif.* They were first described in 1885 by Gilles de La Tourette, under the caption of "A Nervous Affection Characterized by Motor Inco-ordination, Accompanied by Echolalia and Coprolalia."[2] The details of this description are as follows: Motor inco-ordination is the first symptom, beginning gradually without apparently influencing the general health. The face or the upper extremities are first affected, in the latter usually one-sidedly. It is first noticed that the fingers are alternately extended and flexed, or that the shoulders are raised. At about the same time the muscles of the face become implicated, most often with incessant winking, or by one of the buccal commissures being actively drawn upward and outward, or by a contraction of the masseters, causing a grating of the teeth, or by a projection of the tongue, at the same time that this organ may sometimes be lacerated by sudden activity of the masseters. The muscles of the neck taking part in the movements, the head is alternately flexed and extended, and the sterno-mastoids incline it to one or the other side. The lower extremities soon share in the general disturbance, but the inco-ordination in them is somewhat different in that the movements are not limited to isolated muscular groups, as is the case in the parts that we have described, but extend over the entirety of the muscles of one or the other member, and sometimes over both. The patient stamps his foot, stoops or erects himself, or the movement may consist of a veritable jump. All these movements are very sudden and very rapid, and each first set of movements is quickly followed by further ones. During one of these series of movements the patient suddenly, at the time of a movement, gives vent to an inarticulate cry like "hem," "ah," which sound may be repeated several times. At times this cry may be articulate, consisting of a word which varies from patient to patient, and which has certain of the characteristics of an echo; hence the name *echolalia.* The *coprolalia* was regarded by La Tourette as pathognomonic, and consists of profane oaths or obscene epithets. This author regarded the affection as an eminently chronic one, and also as invariably hereditary. The French authors had their attention directed to the subject by the descriptions of two American authors—those of Beard upon "The Jumpers of Maine," published in 1880, and that of Hammond upon "Miryachit," a similar disease of the far Orient. Beard found that the jumpers of Maine did unhesitatingly whatever they were told to do. Thus, one who was sitting in a chair was told to throw a knife that he had in his hand, and he obeyed so quickly that the weapon stuck in a house opposite; at the same time he repeated the command given him, with a cry of alarm not unlike that of hysteria or epilepsy. When he was suddenly clapped upon the shoulder he threw away his pipe, which he had been filling with tobacco. The first parts of Virgil's *Æneid* and Homer's *Iliad* were recited to one of these illiterate jumpers, and he repeated the words as they came to him in a sharp voice, at the same time jumping or throwing whatever he had in his hand, or raising his shoulder, or making some other violent motion. It is related by O'Brien, an Irishman serving on an English naval vessel, that an elderly and respectable Malay woman, with whom he was conversing in an entirely unsuspecting manner, suddenly began to undress herself, and showed a most ominous and determined intention of stripping herself completely, and all because a by-standing friend had suddenly taken off his coat; at the same time she manifested the most violent anger at what she deemed this outrage to her sex, calling the astonished friend an abandoned hog, and very properly begging O'Brien to kill him. O'Brien, furthermore, tells of a cook who was carrying his child in his arms over a bridge on a river, while at the same time a sailor carried a log of wood in like manner, and how the sailor threw his log of wood on an awning, amusing himself by causing it to roll over the cloth, and finally letting it fall to the bridge, when the cook repeated every motion with his little boy, and killed him on the spot. This *Miryachit* was observed in Malaysia, Bengal, among the Sikhs and the Nubians, and in Siberia, whilst Beard has observed it in Michigan as well as in Maine.

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[1] Read before the New York Neurological Society, March 5, 1895.

[2] *ήκώ* echo, *λκλω* to speak, and *κοηρος* obscenity, and *κισρος* indecent.

The French authors would have us consider all this complex of symptoms—namely, the sudden and rapid muscular contractions, the jumping, the tendency to imitation, the coprolalia, and the echolalia—as constituting one and the same affection, and to it they have given the name of *tic convulsif.* Inasmuch as I have found, for reasons that I shall endeavor to make plain in this paper, that the main symptoms of the affection are much more frequent than has hitherto been supposed, I have ventured to coin for it a new name. *Latah* and *Miryachit* are Malaysian and Russian names respectively, whilst *tic convulsif* either will be confounded in most Anglo-Saxon minds with *tic douloureux*, or else it conveys no meaning at all, because the word tic, which has a time-honored meaning in the French language, is unknown to ours. Moreover, the affection possesses more analogy with chorea than with any other affection, and I have, therefore, thought that it would be more proper to have it become known by a name derived from the Greek. With this end in view I have found ὁ παλμὸς, which is a good old Greek word used by Aristotle to describe palpitation or twitching of the heart, and I have simply Latinized it into Palmus, which medical men will have no occasion to confound with the Greek words ὁ πάλμος, "the king," the more especially as the accent in the latter is on the first syllable, whilst in my Latinized word Palmus it should be upon the last. The adjective is palmodic, from the Greek παλμωδης. It is far from being proved, however, as La Tourette supposed, that these five symptoms—palmus, or convulsive tic, tendency to imitation, jumping, coprolalia, and echolalia—are necessarily found together. In a very interesting monograph, published in 1893 by Noir, upon these tics, he has made, by observations among what the French call the degenerate, the imbeciles and idiots, a most valuable addition to our knowledge, at the same time that the existing literature has been carefully gleaned; and in this pamphlet it is demonstrated that all these symptoms may be observed in some patients, whilst in others the palmus alone is seen; in others, again, the echolalia or the coprolalia; whilst I have never observed the jumping or the coprolalia in any of my cases. Noir divides palmus into the following types:

1. The simple co-ordinated tics, most often rhythmical;
2. The slight co-ordinated non-rhythmical tics;
3. The co-ordinated tics of the blind;
4. The grand co-ordinated tics, of which there are two varieties, the simple and the complex.

Under the head of simple co-ordinated tics are placed the balancing of the body, the rotation of the head, and the butting or striking, for which Roubiniwitch has proposed the name of *krouomania.* These manifest themselves most frequently when the patient is seated, and consist of a violent antero-posterior movement of the trunk; or the head alone is moved by long, rhythmical, regular movements, or is rotated from right to left with great rapidity, or is violently butted against the nearest object. The small, co-ordinated, non-rhythmical tics are of the greatest diversity. Often beginning as a habit, they become constant and rapid repetitions of ordinary movements, and with idiots these movements are imitations, or have their origin in the necessity for motion. They are frequently united with the convulsive tics, with the balancing of the body, or the rotation or the butting. Noir has called special attention to a palmus which he has observed most frequently in blind idiots, consisting of rapid movements of one finger before the eyes. His explanation is that the blindness generally not being so complete as to prevent the perception by the retina of some luminous rays, the blind idiot causes alternate movements of light and shade in this manner, and voluntarily causes this sensation—a rather far-fetched explanation, I am afraid, which needs explaining. The grand co-ordinated tics were seen by Noir only in vigorous idiots, and are either simple or complex. They consist of all sorts of fantastic movements; indeed, they are really attitudes, and I do not think they should be classed with palmus or tics at all. Anyone who is familiar with idiots knows the meaningless gestures which are common to certain of them, ordinary voluntary movements made seemingly automatic by the limitation of the intelligence. In some of these cases there has been described a tendency to persistent and fixed ideas or even a slight delusion with fear of places (*agarophobia* or folly of doubt), and, as we have already stated, Noir has studied them among the idiots of the Bicêtre.

My own observations have taught me that this disease, studied by the European authors entirely among the hopeless inmates of idiot asylums and in chronic cases, is by no means infrequent in relatively subacute and slighter types in the population at large. I have seen a number of cases among the patients who have come to my office. These are divisible into the following types:

1. Facial palmus;
2. General palmus;
3. Acute palmus;
4. General palmus with pseudo-melancholia.

Facial palmus constitutes by all odds the most frequent type. It consists of sudden, instantaneous, shock-like movements of lightning-like rapidity, that go to make up a sudden wink or twitch of one cheek, occasionally of both, or of the brow. This series of movements is generally followed by a second series that, however, is much weaker, and sometimes even by a third. Sometimes the head is retracted or drawn forward, or one shoulder is elevated. In the majority of the cases the winking is bilateral, but the other movements just named are usually unilateral. I am inclined to think that this is a much more common affection than is generally supposed, or even than could be gathered from my own observation, because I have a strong suspicion that most or the cases of so-called chorea that are treated by oculists are really cases of facial palmus. It is undoubtedly true that in a large proportion of these cases errors of refraction will be found, but what the percentage is I cannot say, because all of my cases have not been examined for this defect, and even if they had been they are not sufficient in number to be satisfactory. But whether this error of refraction is one of the attendant symptoms of the disease, or whether it is a mere coincidence, I cannot undertake to say. I have never yet been able to see in four cases any improvement in the disease result from the mere correction of refraction, although I am inclined to think that in some individuals this correction, together with the use of arsenic, has a beneficial effect. In two cases I have seen a very distinct improvement obtained by the relief of disease of the turbinate bones, but this gain was only temporary in effect. The cases which I have seen of this facial palmus have been of long duration, usually commencing in early childhood and invariably in those whose heredity is neurotic, although not necessarily to a marked degree; in other words, I have seen it occur at the one extreme, as illustrated by a female now under my care who is thirty-one years of age, and whose maternal aunt has been insane, whose sister had a similar trouble, and whose brother had chorea; whilst, on the other hand, I have observed it in several cases of young children, varying from six to ten years of age, in whose family, as would be shown by careful questioning, there had occurred some slight nervous troubles.

The cases of general palmus which I have seen answer very accurately to the description that was given of convulsive tic by La Tourette, except that I have not seen in them any coprolalia, nor the inco ordination of movement that this author speaks of. They consist of intermittent, sudden, shock-like movements of diferent muscles of the body. In the face these may be repeated, as in the facial palmus, twice or even three times; but there is not the same tendency to repetition in the other muscles affected. What I suppose would answer to a description of echolalia has also been seen in these cases, although it, I think, is rather sensational and exaggerated to liken it to an echo, for the inarticulate noise is rather a grunting or squeaking sound, very much like that which is heard in many cases of chorea. It has always been accompanied by a sudden movement of the throat, neck, and head muscles, as in a sudden throwing out of a note in singing. It is almost impossible to describe the sound in words; indeed, it has seemed to me more like a sudden spasmodic expiration, such as would be heard if a person were suddenly struck upon the abdomen, than any articulation such as "*hem*" and "*ah,*" as La Tourette would have it to be in his cases. The movement in the legs is usually that of a sudden extension, and in the arms the extensors also seem to be mainly affected. In all of these cases that I have seen the intelligence is not only unimpaired, but it seems to be the rule, as is the case in chorea, that the patients are unusually intelligent; thus, one of my patients, a man thirty-six years of age, who has found this malady a great barrier to his success in life, yet learned stenography in three months sufficiently well to take the prize in a competitive examination into which one hundred and fifty individuals had entered; whilst another patient, the young woman thirty-one years of age, of whom I have already spoken, is of an unusual order of mental capacity. This type is also of long duration, commencing in early childhood and running uncured, so far as I can judge from my limited cases, as far as forty years of age. In one of the cases of this type there were at times exacerbations lasting a week or ten days, in which the patient became exceedingly pale, cold, with slight shivers, and evidencing a condition of widespread motor spasm, in which the fingers would even participate for a few hours, so as to assume the similitude of Raynaud's disease.

I have seen only one case of acute palmus. It was in a boy of six, whose heredity, as far as I could ascertain from the statements of his mother, was not neurotic. He had had trouble some six months before coming to me. He had been labelled with a number of interesting diagnoses, such as chorea, epilepsy, myotonia, hysteria, and neurasthenia. His palmodic movements were very curious. When standing near a table, looking at something, the chin would suddenly come down with a thump that would leave a black-and-blue mark, or his head would be thrown violently to one side, perhaps coming in contact with some adjacent hard object with equal force, or, while standing quietly, his legs would give a sudden twitch, and he would be thrown violently to the ground, and this even happened several times when he was seated on the edge of a stool. The child was under my care for two weeks, and, probably because of an intercurrent attack of diarrhœa, grew steadily worse during that time, in spite of the full doses of arsenic which were administered to him. He was literally covered with bruises from the sudden and violent contacts with articles of furniture, the floor, and the walls. At last, in despair at his condition, I ordered him to be undressed and put to bed, and steadily pushed the Fowler's solution of arsenic until he was taking ten drops three times a day, when to my great surprise he began to improve rapidly, and at the end of six weeks was perfectly well. Keeping him under observation for two weeks longer, I finally sent him to his home in the West, and am informed that he has since remained perfectly well. It has seemed to me that many of the cases recorded as paramyoclonus multiplex have been really acute palmus.

General palmus with pseudo-melancholia. I have seen two cases of this variety. The muscular movements are of the usual sudden, shock-like type, and of the same extent as in what I have ventured to call the general form. With them, however, there is associated a curious pseudo-melancholia, consisting of certain fixed melancholy suspicious delusions, without, however, any of the suicidal tendencies and abnormal sensations up and down the back of the head, neck, or spine, or the sleeplessness, which are characteristic of most cases of true melancholia. In both of my cases the palmus had existed for a long period, the exact limits of which, however, I could not determine, because the patient scouted the idea that he had had any trouble of the kind, but which the testimony of friends and relatives seemed to vouch for. They were both men, one thirty-six and one thirty-eight years of age. The pseudo-melancholia, however, had only existed in one case for about a year, and in the other for six months. One case passed away from my observation, and I know nothing of its further course. The other case recovered in nine months' treatment, and during the three years that have since elapsed he has been an active business man, although I have not seen him myself during that period, as he took a great dislike to me because I was forced to take strong measures to keep him under treatment, so persistent were his suspicions. One of these cases was mistaken for general paresis with a melancholy onset by a competent neurologist of this city, and he persisted in his diagnosis until the course of events demonstrated his error; indeed, it is not wonderful that this should have been the case, because anyone who is not familiar with this type of disease might readily be thus misled. There was, however, no element of dementia in the case; on the contrary, the man's mind, except so far as his melancholy delusions and suspicions were concerned, was keen and intelligent, as were also his perceptions.

The diagnosis of these cases can readily be made. The only disease with which they are likely to be confounded is chorea, from which they differ radically. In chorea the movements are of two varieties, and both usually involve the fibrillæ of muscles and not muscular groups either acting singly or in co-ordination with other muscular groups. The fibrillary movements of chorea, too, consist either of a sudden contraction quickly beginning and quickly ending, or the contraction in the athetoid form is more gradual. Chorea, moreover, is always generalized, so that the movements are found in the upper and the lower extremities, in the trunk and in the face, and occasionally also in the abdominal and laryngeal muscles. But the movements of facial palmus are always limited to the face; even in general palmus the distinction from chorea is very marked, for in the latter disease the movements are always fibrillary, of the sudden or gradual character that has been described, whereas in the latter they are sudden—shock-like—with much longer intermissions than is the case in chorea.

The prognosis of these cases varies according to the type. I have never yet seen a case of the facial or general variety cured, but I think this statement needs to be taken with some qualification, because in no one of these cases have I ever been able to carry out thoroughly the rigid treatment which is usually so very successful in cases of chorea, namely, prolonged rest, with increasing doses of arsenic. Whether or not it would be of use in the facial variety might be a matter of doubt, but I believe that there is reason to hope for success in a certain proportion of cases of the generalized type. Then, too, if we carefully study our cases of chorea, it will be seen that there are very few of them that are really thoroughly cured, even by any treatment, for the most that we can hope to do is so to diminish the number and the frequency of the fibrillary movements as to obtain a large degree of improvement; but it has been my custom for years to exhibit so-called cured cases of chorea in which patient watching would demonstrate the existence of a few isolated fibrillary twitches. With the relatively weak movements of chorea this is a sufficiently practical result to obtain, but with the sudden, shock-like movements of palmus this would not answer the expectations of patients. The acute palmus was readily cured, as I have already stated. One case of palmus with pseudo-melancholia was cured, I believe, although, as I have already said, I cannot speak positively about this; and the other case I was not able to treat.

There has been nothing to throw any light upon the pathology of this affection. It is true that Gilbert Caddiot and Roger claimed that they stopped a so-called palmus of the ear in a dog by removing the nucleus of the facial nerve in the pons, having without effect previously destroyed the cortical centre of the facial, the internal capsule, the optic thalami, and the cerebellum. But, whilst this experiment is interesting, any neurological experimenter knows that it is impossible to limit a destroying instrument to such a minute space as would be constituted by the facial nucleus.

I am sorry that I cannot say much about the therapeutics of palmus. Arsenic certainly has a beneficial effect upon it, but this is not of so long duration as the same drug has in chorea. My acute case, however, was cured by the arsenic and the rest. It may, of course, be questioned as to how much was done by the rest and how much by the arsenic; but in regard to this I can only say that even before the case was put to bed the arsenic had effected some amelioration. In the facial and general varieties the arsenic alone will not answer, and in the one case of generalized palmus with pseudo-melancholia I could never perceive that arsenic had any effect whatever. Hyoscyamine and hyoscine have a beneficial effect that has only seemed less than that of arsenic. I gave them in doses of $\frac{1}{100}$ grain three or four times a day. Iron, which is so extremely beneficial in chorea in large doses, in conjunction with increasing quantities of arsenic, has been utterly without effect in this disease, as have also the bromides. Galvanic electricity is of distinct benefit, quite as much so as the arsenic in the cases of facial palmus; but I have not had the opportunity of using it in the other varieties. In facial palmus, also, as I have said, I have seen distinctly beneficial results from the removal of errors of refraction or irritative lesions of the naso-pharynx. My impression is that the treatment of these cases should be as follows: Arsenic should be given in the form of Fowler's solution, at first three drops three times a day, and gradually increased so that in the course of a week or two eight or ten drops three times a day are taken. At the same time galvanism should be applied carefully to the pes anserinus in facial palmus and to the spinal column in the general form, a current of three to five milliampères being used every day, from three to five minutes at a time. Absolute rest of the patient in bed, for a period of one to two weeks at the outset, should always be used, even in the cases of facial palmus. At the end of this time the patient should be allowed to sit up two or three hours a day, and this period of sitting up should be very gradually increased, so that at the end of three or four weeks more the patient should be out of bed throughout the afternoon hours, but should remain at rest during the morning and evening for a period extending for at least eight to ten weeks from the onset of treatment; and even after this long walks and rides and strenuous occupation should be carefully avoided for several months. All errors of refraction should be corrected and all irritative lesions of the naso-pharynx should be, if possible, removed. In conjunction with these special measures, the patient's general health should be brought to the highest point possible by careful and generous diet and proper tonics.

I am aware that this paper is purely fragmentary. It must necessarily be so, because we are only on the threshold of this subject, and my object has been simply to call the attention of the profession to a disease hitherto little known in this country; although I believe it is quite widespread, so that further observations may bring us accurate knowledge which may even, I am quite prepared to state, materially modify some of my conclusions.

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REVIEWS.

THE INSANITY OF OVER-EXERTION OF THE BRAIN; BEING THE MORISON LECTURES DELIVERED BEFORE THE ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, SESSION OF 1894. By J. BATTY TUKE, M.D., F.R.C.P. E., F.R.C.S. E. With Illustrations and Diagrams. Edinburgh: Oliver & Boyd.

THE little volume before us, we venture to say, is one of the most valuable and suggestive that can in these days of rapid progress be brought to the attention of the neurologist. It embraces the five Morison lectures delivered by Dr. Tuke before the Royal College of Physicians of Edinburgh in 1894.

The first lecture is a clear and concise statement of the structure of a cerebral convolution, in which the important advances contributed by Golgi, Ramon y Cajal, Obersteiner, Retzius, Bevan Lewis, and others receive their full share of attention. All of the essential points are beautifully illustrated by a large colored plate. Space forbids our entering into the details of this admirable description, as they can only be understood by reference to this plate. It will suffice, perhaps, to recall that in addition to the various layers of cells found in the cortex, four in number, and to the projection, commissural, and association systems, there are other and much thicker fibres, "proceeding possibly from the medulla or cerebellum, which, passing usually in an oblique or horizontal direction through the thickness of the gray matter, form ramifications of enormous extent throughout its whole substance, the superficial zone included. The terminal branches form varicose arborizations which appear to inclose preferentially the small pyramids." Further, the relations of the nerve-cells to the capillaries and lymph-spaces are not only of physiological but of profound pathological importance, as we will presently see. The body of each cell "is encapsulated by a projection of the hyaline sheath of its nutrient capillary, the perivascular space so formed being the commencement of the lymph-path which leads from the cell to the main lymphatics of the head and neck. The brain has no true lymphatics, and is dependent on the perivascular system for the removal of effete and superfluous material. All of the blood-supply of the convolutions is derived from the pial arteries, "which on the summits are given off directly, and in the sulci form large descending branches. Each vessel carries with it a prolongation of the pia which surrounds the vessel to its ultimate branches. This is often spoken of as the adventitia of the vessel. From this pial or hyaline sheath processes are given off which encapsulate the cells, each of which is thus surrounded by a perivascular capsule."

With such facts as these before him, the author begins the second lecture with a consideration of the various causes of implication of the apparatus. Among these, over-exertion of the brain is evidently one most interesting and important. Physiological hyperæmia, the result of brain activity, the rise of temperature that accompanies this process and other associated phenomena are dwelt upon. The author, further, dwells *in extenso* upon the significance of Hodge's discoveries in regard to the loss of substance in cells and the difference in reaction to stains after prolonged activity, *i. e.*, the changes which are noted in nerve-cells after fatigue; and he also alludes to the interesting discovery of Mosso, who clearly demonstrated that fatigue caused by psychical action produces not only a poisonous effect on the general system, especially the muscular, of the person experimented on, but he has also shown that the injection of blood taken from an exhausted animal into the circulation of animals at rest produces in them the extreme indications of fatigue. He is of opinion that the symptoms of poisoning are produced more from the breaking-down of nerve-cells than from any impairment of nutrition.

In the third lecture Dr. Tuke dwells upon the accentuation of general pathological changes in the Rolandic area. Thus, he says, it may be considered as a fact that the condition of the pia as viewed by the naked eye affords a fair index of the degree of *active* morbid action going on in the subjacent convolutions, and at the same time he directs attention to the apparent difficulty in that the very regions, namely, the frontal lobes, the aberration of whose functions is a prominent symptom of the insanity of over-exertion, present in most cases slight visible departures from normality of the membrane. For this curious fact he suggests the following ingenious explanation: In the frontal region the cell-degeneration is of a granular character, which may more or less rapidly go on to destruction and absorption. This, to his mind, "is indicative of impaired nourishment rather than of active morbid action—of interruption of trophesial function—which depends on the maintenance of the integrity of cell-connection. To this destruction of cell-material and of the implication of nerve-fibre, presently to be spoken of, must be ascribed the general shrinkage of the anterior lobes so often noted in the insane." "In the course of almost every case of idiopathic insanity —*i. e.*, insanity due to over-exertion of the brain—we have a fairly well-marked prodromal period indicating the diseased balance between nutrition in the kinæsthetic area. As the impaired function of the cells of this area makes itself felt on the cells of ideational centres, whether by lessened or increased conduction of energy, or by modification of their nutritive influences, we have reduction of their structural integrity and perversion of psychical acts. As every case runs its course to recovery or to permanent insanity, we have a period of mental and physical torpor, which we speak of as dementia. On the rapid removal or non-removal of the causes of implication of the cells of the Rolandic area depends the issue of the case—recovery or prefrontal atrophy."

The milkiness or infiltration of the pia he regards justly as dependent on the damming back of the lymphatic stream. This condition first appears "as a fine milky line along the course of the pial veins, and is due to the deposit of waste and plastic exudates. As these accumulate and diffuse, the membrane becomes thick, tough, and on section is found to consist of a mass of material which looks like an immense increase of the normal trabeculæ. Through this thickened structure the flow is slow, and the waste material which would have been disposed of were the channels patent is deposited in a certain circumscribed area. It is probable that the fluid is filtered in the thickened pia, and that as it reaches the larger cisterns it is so slightly loaded as to pass freely into the wide space in the spinal canal." The predominance of these appearances in the area of distribution of the middle cerebral artery suggests the query, "Is it that the demand for blood by the active part of the organ leaves after it the signs of work and the evidence of waste of tissue?"

In a further consideration of the trophic interrelation of different portions of the brain, especially the relations between the frontal and Rolandic regions, he is led to express the conviction that "in the brain interruption of connection is brought about by Wallerian degeneration of fibres, processes, and collaterals, the result of structural implication of cells produced by over-stimulation and mantained and aggravated by the effects of poisonous exudates."

In the fourth lecture the author takes up the consideration of the symptomatology and etiology of over-exertion of the brain, and in the fifth and last dwells at some length upon the treatment. The latter consists essentially of prolonged rest, with the use of few or no drugs. Especially does he insist upon securing sleep by simple means, such as counter-irritation to the back of the neck, warmth to the feet and back or over the abdomen, or by gentle shampooing or massage applied to the head or neck. The kidneys also should be stimulated. "As a rule, the patient begins to sleep by snatches, and, as the case goes on, in more continuous periods. No doubt steady sleep for five or six hours, or even longer, is what we hope for; but if a patient, who for days or weeks previously has hardly slept at all, and then only probably by the use of alcohol or opiates, gets five or six hours in the twenty-four by an hour or two hours at a time, he does fairly well."

When medicines are required Dr. Tuke makes free use of antipyrine, giving as much as fifteen grains every two hours, and he tells us that "it very generally soothes and produces sleep, and the general condition improves;" and to this he adds the statement that he has "frequently given antipyrine to the amount of 60 to 100 grains per diem for a fortnight at a time," and that he has "never noticed any of the ill-effects ascribed to it, except occasionally nausea and vomiting. It may be that patients in the condition we are speaking of may be more tolerant of the poison than those in whom temperature runs high. As in all nervous cases, the dosage is at first a matter of experiment; but it is quite safe to begin with the dose above indicated, raising it somewhat, and administering it more frequently, according as the patient's condition improves."

If forced to use other remedies, he prefers paraldehyde, administered in two to three drachm doses per rectum.

In closing he regrets the fact that general hospitals are closed to cases presenting mental symptoms unless these are produced by alcohol. He says: "I have no hesitation in saying that were wards set aside in each of our general hospitals for the treatment of early cases of insanity by the ordinary physicians a vast amount of misery would be relieved, and, what appeals to a large section of the public, the yearly increasing expenditures on asylums would in no slight measure be obviated."

In the prefatory notes to these lectures he tells us that since their original publication in the *Edinburgh Medical Journal* important investigations have been made bearing on certain opinions and theories advanced in them, and that though he does not deem it advisable to anticipate the fuller publications of these investigations he feels justified in saying that they throw much light upon the nature of cell-changes, upon the rapidity of subsequent deterioration of the connective apparatus, and on the absolute necessity of rest for recuperation, and that they will thus aid us to arrive at a rational treatment of the insanities.

It is to be regretted that among the various names of men to whom he gives credit that of Weir Mitchell does not occur, especially as the treatment proposed by Dr. Tuke for the incipient insanities of overexertion is essentially the rest-cure method as introduced by this distinguished American. F. X. D.

ASEPTIC SURGICAL TECHNIQUE, WITH ESPECIAL REFERENCE TO GYNECOLOGICAL OPERATIONS, TOGETHER WITH NOTES ON THE TECHNIQUE EMPLOYED IN CERTAIN SUPPLEMENTARY PROCEDURES. By HUNTER ROBB, M.D., Associate in Gynecology, Johns Hopkins University; Professor of Gynecology, Western Reserve University, Cleveland, Ohio. Illustrated. Pp. xvi., 264. Philadelphia: J. B. Lippincott Company, 1894.

FROM our knowledge of the excellent experimental and practical work which the author has been doing for several years in connection with the perfecting of surgical technique, we are prepared at the outset to accept without hesitation the concluding statement in Dr. Kelly's introduction, that he is "eminently qualified to speak and command our interested attention in relation to the subjects treated in the book before us."

The introductory chapter will be especially valuable to the general reader, who will learn from it the practical value of laboratory investigations. Many successful operators who pride themselves on being purely "practical" will not admit the debt which they owe to the patient toilers at the microscope, who have done so much to remove the element of empiricism from modern surgery. The author rightly insists upon "the necessity of the harmonious working together of the surgeon and clinician with the bacteriologist, believing that each and all will in this way gain new facts and new points of view."

The chapter on sterilization and chemical disinfection is concise but thorough. We note with satisfaction a lucid exposition of the point so commonly overlooked by the profession, that the indiscriminate use of strong antiseptic solutions during an operation is *not* asepsis.

Chapter III., on the practical application of the principles of sterilization to operating-suits and the preparation of the surgeon and his assistants, may seem unnecessarily refined to one who is not accustomed to the exact methods of modern hospitals; but we can assure the critic that the precautions described *pay*. It may not be possible or desirable for many to adopt exactly the technique recommended, but the principles involved must be mastered by every surgeon who essays to rise above mediocrity. "Any good work," we read, "necessarily involves a great deal of drudgery, and in the technique of the newer surgery the lazy man has no place."

The description of the preparation of the field of operation is clear and precise. The chapter on instruments is exhaustive, and is rendered especially helpful to the general reader by the numerous illustrations. We are interested in noting, under the head of sutures, the statement that catgut, however carefully it may be prepared, cannot yet be regarded as a perfect suture-material from a bacteriological standpoint. In view of the contrariety of existing opinions on this subject, the author's dictum must have considerable weight. With some of the statements regarding drainage-tubes we are not entirely in accord, being inclined to think that the natural deduction from the quoted objections of Dr. Welch would be to dispense with them entirely. We believe that the time will come when it will seem incredible that drainage through the abdominal wound should ever have been regarded as the ideal method. The remarks on the inadvisability of irrigation of the cavity, except under rare conditions, will now meet with the approval of most cœliotomists.

Chapter XI., on the operating-room and its furnishings, is handsomely illustrated, and though one may not feel disposed to copy for his own use all the appliances described, they certainly combine the important qualities of cleanliness and simplicity.

In the excellent chapter on the aseptic operation we note that the author finds the Trendelenburg posture "inconvenient and in the majority of cases unnecessary." While, of course, this is a question of individual preference, we are not prepared to admit the force of his objections thus briefly stated. The testimony of scores of successful operators who have adopted it cannot be lightly dismissed. Neither does the criticism that the elevated posture favors "the spreading about among the intestines of any fluids that may be present in the pelvis" strike us as being an unanswerable one, since it is assumed that the operator has thoroughly protected the intestines from contact with such fluids before beginning his manipulations within the pelvis.

The chapter on post-operative care supplements admirably the one which precedes it, and is quite a model of its kind. The same comment applies to the succeeding one on private operations.

The chapter on examinations, though good, belongs more properly to a regular text-book on gynecology, while the one on catheterization of the ureter interests the expert more than the general reader. The transposition of Chapters XVI. and XVII. would render the sequence a more natural one.

The chapters on bacteriological and pathological examinations are thoroughly practical. We entirely agree with the writer when he deplores the sad waste of valuable anatomical material in this country. But, unfortunately, few institutions possess the facilities for pathological work of the Johns Hopkins Hospital, even if the surgeons and their assistants were imbued with the same scientific ardor, and fewer busy operators have the time or inclination for personal investigations.

We have merely outlined the contents of this attractive little volume, which deserves, and ought to secure, a wide circulation. It is written in a clear, straightforward manner, and impresses one as a record of personal observations and results. Although the criticism may be made that its tone is somewhat dogmatic, this element is quite allowable in an author who is entitled to speak *ex cathedra*. It is thoroughly in accord with the spirit of modern surgery, and is an admirable exponent of the teachings of an institution the high aim of which is to keep before the profession the fact that medicine is a progressive science as well as an art. It may be that many experts who glance at this modest work will think that they do not need the minute instructions in the details of aseptic technique, but we are sure that the general reader will derive from its perusal a clearer idea of the factors which lead to success in gynecological surgery than he has ever had before. After all, the best tests of the value of any method are its *results*, and judged by this criterion the author and the hospital in which he received his thorough training may be regarded as above any superficial criticism.

H. C. C.

MATERIA MEDICA, PHARMACOLOGY, AND THERAPEUTICS; INORGANIC SUBSTANCES. By CHARLES D. F. PHILLIPS, M.D., LL.D., F.R.S. (Edin.), Late Lecturer on Materia Medica and Therapeutics at the Westminister Hospital Medical School; Late Examiner in the University of Edinburgh, etc. Second edition. Pp. xiv., 898. London: J. & A. Churchill, 1894.

THIS work follows the same plan as did the first edition, which was published twelve years ago. Many sections have been extended, and others have been added, notably those treating of oxygen, hydrogen sulphide, iodoform, mineral waters, chromic, hydrobromic and lactic acids. The remedies are not classified, nor indeed is an alphabetical order followed. Each chemical is defined, its preparations stated, its character and tests, the method of absorption and elimination, its physiological action, both external and internal, and its external and internal therapeutical action, the various pathological conditions and diseases being taken up *seriatim;* finally the preparations and doses are briefly presented. Both pharmacopœial and non-official preparations are discussed. Covering only the smaller inorganic division of materia medica, a bulky volume should contain but few omissions. A careful reading shows that the current literature has been thoroughly studied, and in general the best has been presented, British in the greater part, American to some extent, and the Continental to a less degree being laid under contribution. Omissions of important methods are not very common, yet the advantages of the syrup of hydriodic acid over the alkaline iodides in ease of administration and effectiveness, the use of digestive ferments with the iodides, as popularized by Delavan, should have been mentioned. In the treatment of typhoid fever we expected to have found stated the great value of chlorine as an intestinal disinfectant and a full account of its literature, of which, by the way, the best is of British origin. In references to the United States Pharmacopœia the author is by no means accurate; for instance, (p. 533) *liquor barii chloridi* is not official in that work, nor, as a matter of fact, is any preparation of barium chloride. An occasional unusual expression is found; we willingly admit that the taste of bromine, even when well diluted, is unpleasant, but we scarcely believe that it is "truly horrid" (p. 137). The physiological action of remedies is carefully presented. Some sections, for instance that upon water, are well rounded out and eminently satisfactory. The strongest feature of the book is the therapeutical application of remedies, generally very complete, usually well selected, very infrequently containing obsolete material, occasionally somewhat diffuse, but on the whole well digested. In this department the journals and year-books have been extensively read. We wish that the author had more freely given us his personal experiences at many points in the book. As it stands free from many, and to the practitioner needless, details, it offers to him a fair presentation of modern knowledge, not unduly enthusiastic as to the clinical results to be obtained from this or that remedy, nor yet pessimistic as are frequently the utterances of many practical physicians. We regard the work as useful to the practitioner who wishes to refresh and enlarge his knowledge, and from which he can obtain many new ideas. The book is readable and one that will win a place for itself in the esteem of the profession.

R. W. W.

TRAVAUX D'ÉLECTROTHÉRAPIE GYNÉCOLOGIQUE. Par le DOCTEUR G. APOSTOLI, Vice President de la Société Françaisé d'Électrothérapie, etc. Paris, 1894.

CONTRIBUTIONS TO GYNÆCOLOGICAL ELECTROTHERAPY. By DR. G. APOSTOLI.

IN this work Apostoli has collected the contributions to gynæcological electrotherapy which have appeared in the various American and foreign journals during the past eight years. There is nothing new in this compilation to those who have followed the development of the subject during the period in question. It is simply a collection in a single language of material which has been already published in the French or in some other language. There are some who cannot conscientiously regard the subject with the same degree of ardor and hopefulness which was experienced a few years ago; indeed, we may go further, and say there are few who have the same confidence in this form of therapy which they once had. Even the most sanguine enthusiasts speak with less assurance of the therapeutic effects of electricity as applied to pelvic and abdominal disease than they did. What is the cause of this? Partly that the claims as to the utility of electrical treatment were too extravagant; partly that the armamentarium, to be at all efficient, is too costly and complicated ever to be brought into general use; partly that such improvements in surgical technique have been developed that radical results are possible with far less risk to life than formerly, and with far less outlay of time, if not of money, on the part of the patient.

We have looked through this compilation with considerable care, and have read many of the clinical histories of which the work is largely composed. Some of the statements (those of the Keiths, for example) we believe absolutely truthful and credible. They have narrated cases in which fibroid tumors were entirely and permanently cured by electrotherapy. There are few who have used this means of treatment who have had a similarly fortunate experience. It matters little whether they be told that they have used the agent improperly or not; they have done the best they could and have failed, and the agent is, naturally enough, discredited in their eyes. Now, this does not imply that electricity is useless in pelvic disease, but simply that it cannot supersede surgical measures, for the reason that it is uncertain as to the effects produced. It is distinctly inferior to surgery in many instances in which both means have been tried. It would be a great boon to humanity if a measure involving no risk to life, painless in application, and certain, or nearly certain, to bring relief for the trouble for which it was employed, could be found; but electricity has not as yet answered those conditions, though it has been asserted it would. A very useful field is, however, open to electricity in the treatment of the minor forms of pelvic disease and in the palliative and preparatory treatment, in not a few instances, of the more aggravated forms; but Apostoli himself concedes, with greater frankness than some of his followers, that its scope is more circumscribed than he was in the habit of admitting a few years ago. We have no sympathy with those who decry electricity as useless or invariably harmful. Such assertions usually come from those who are prejudiced against it, and who are either without experience in its use or so biased that careful observation of its effects *pro* and *con* would hardly be possible.

We shall welcome from Apostoli, or any other source, any information and experience which will demonstrate conclusively that it has latent virtues which have not yet been discovered; but until then we can see no possibility of its holding any position but a subordinate one to surgery.

A. F. C.

ATLAS OF ELECTRIC CYSTOSCOPY. By DR. EMIL BURCKHARDT, of Basel, and E. HURRY FENWICK, F.R.C.S. Eng. London: J. & A. Churchill.

CYSTOSCOPY has in reality scarcely yet attained to its puberty, as the instrument of Nitze and Leiter was presented to the Vienna Society of Physicians but fourteen years ago. In view of its tender years, as compared with the advanced age of the sounding process, it seems scarcely proper to expect it to conjure marvels, and eminently improper to condemn it because it does not do so. There can be no question that in the hands of an expert the cystoscope is an instrument of great value; that it has already produced a revolution in vesical pathology; and that by its aid we are often enabled to diagnosticate obscure disorders, to contradict preconceived opinions as to the nature of diseases, to form a positive prognosis, and to outline a rational treatment. It is quite true that an examination, to afford information, must be made with a degree of dexterity to attain which requires long and patient practice; in other words, must be made by an expert or specialist. The same fact is, however, true of examinations of the eyes by the ophthalmoscope and of the larynx by the laryngoscope, and the difficulty of the procedure does not destroy the claims of the process to be a legitimate and often essential diagnostic method.

The plates are masterpieces of art, and will serve a valuable purpose as guides for study and comparison. The plate of renal hæmaturia shows the ureteral orifice of the diseased side vomiting blood as a volcano throws up lava. Cystitis is exhibited in all its forms. Vesical tuberculosis, tumors, calculi, foreign bodies, fistulæ, and ulcers are graphically portrayed,

This book will prove eminently useful, in fact invaluable, to a genito-urinary surgeon, as it is a faithful reproduction of the appearance of the bladder in various diseases, and is the result of the painstaking and accurate studies of two most able and distinguished observers.

J. C. DA C.

LES TRACTIONS RYTHMÉES DE LA LANGUE. Par J. V. LABORDE, Directeur des Travaux physiologiques à la Faculté, Membre de l'Académie de médecine. Pp. iv., 187. Paris: Felix Alcan, 1894.

THE RHYTHMIC TRACTIONS OF THE TONGUE.

THIS little book treats of a rational and powerful means of re-awakening the respiratory function, and has for its text "the physiological treatment of death." In the tenth chapter we find explained the physiological mechanism of the action of these tractions, which is, briefly, that it is upon the sensory nerves, the superior laryngeal, glosso-pharyngeal, and lingual; the excitation of these being transmitted to the bulbar centre, is carried outward by the motor nerves, the phrenic (for the diaphragm), the nerves of the thoracic muscles, and the nerves of the respiratory muscles of the face or the facial nerve. This is well shown in a colored plate. The experimental work was carried out upon a dog and upon guinea-pigs submerged in water until they were apparently dead. The clinical aspect of the question is well shown in the sixty-three cases, collected from various sources, in which the patients have been brought to life by this method. This method, which has for its purpose the establishment of respiration, is indicated in all of the various forms of asphyxia, from drowning, from the action of poisons, even to that produced by electric shock, and not omitting the asphyxia of the newly born. The technique of the author is fully described by Mareschal in the thirteenth chapter. The author claims for his method simplicity, ease of application, and favorable results, even to "veritable resurrections." We have read this work with much interest, and we bespeak for its contents careful study, and, for the method therein described, faithful trial by those who meet with instances of apparent death. R. W. W.

MAN AN ORGANIC COMMUNITY. BEING AN EXPOSITION OF THE LAW THAT THE HUMAN PERSONALITY IN ALL ITS PHASES IN EVOLUTION, BOTH CO-ORDINATE AND DISCO-ORDINATE, IS THE MULTIPLE OF MANY SUBPERSONALITIES. By JOHN H. KING. In two vols. London and Edinburgh: Williams & Norgate. New York: G. P. Putnam's Sons, 1893.

THIS book ranges far afield. It is a work of wide generalizations, attempting to establish certain laws upon the accumulated data of contemporary biological science. It is not a book which will commend itself to the members of the medical profession either by reason of its matter or of its style. The former is not of absorbing interest to physicians, and the latter is incomprehensibly heavy and dull.

There are, however, certain propositions in the book which appeal to the intelligence of all scientists, and which have some special interest for those physicians who devote themselves to the problems of psychology and psychiatry. As the title implies, the book embodies an attempt to explain, or to state anew, the vexed problem of the human personality.

The human personality, or the personal identity, which was long regarded as a purely metaphysical concept, and susceptible of only a metaphysical definition, has come to be recognized as the legitimate object, even the necessary object, of modern scientific investigation. As in the case of so many other metaphysical subjects, it is probable that science can yet give the most intelligible explanation of this illusive phenomenon. As Mr. King says: "The world-wide concept of the human personality was that of a conscious ego, a ghost, a something scarcely definable, dwelling in and presiding over the organic faculties constituting the individual." We can see plainly enough now that this was a metaphysical and theological concept, and we can have an intelligent appreciation of Mr. King's laudable and learned efforts to prove that the human personality is in truth a "multiple," a resultant, of what he calls many subpersonalities, but which we can understand better as the multimanifestations of the complicated cell-organization of man. The author slowly and laboriously works out this idea, beginning with the simplest biological objects, the protoplasm and the nucleated cell, and proceeding thence through the vast realms of embryology, physiology, and even pathology, until he reaches his conclusions, which he summarizes in a philosophical but rather dogmatic way.

We note with interest the author's references to some of the problems of mental pathology. He recognizes how admirably his views of the disco-ordination of the human subpersonalities are illustrated in the various forms of insanity. The organic unity of the mind, what we call the personality or the individual identity, is variously and strangely affected by disease. Morbid processes have a disruptive effect, and show conclusively in many cases that the conscious "ego" is in fact a multiple of many minor factors, or "subpersonalities;" hence when deterioration occurs, the varied and fragmentary relics of the once-dominant healthy consciousness, self-consciousness or ego, present often the most instructive studies to the alienist. Mr. King in his book thoroughly recognizes this fact, and uses his material in quite a skilful way for one who apparently has only compiled it. The subject, to be sure, is still obscure, and requires treatment by one more directly familiar by personal study with the phenomena of mental disease, and who at the same time is the master of a simpler and more lucid scientific style than that of the author of this book.

J. H. L.

A Treatise on the Diseases of the Ear, including the Anatomy and Physiology of the Organ, together with the Treatment of the Affections of the Nose and Pharynx which Conduce to Aural Disease. By T. Mark Hovell, F.R.C.S. Edin., M.R.C.S. Eng. 8vo., pp. 720, with 122 illustrations. London: J. & A. Churchill, 1894.

This new treatise on aural diseases constitutes a handsome volume, handling fully and well almost every topic within its range. The author is better known to us as a laryngologist, by reason of his connection with the Emperor Frederick's case; but he keeps this side of his subject within narrow limits. Extensive reference is made throughout to the work of others, with more acquaintance with the later German and French workers than is always to be found in a British book; yet the author is fairly personal in most portions of his teaching. His illustrations are about one-half original, the others being, as a rule, well selected; but his dozen drumhead pictures have the disadvantage of being hardly life-size.

Some sixty pages in the first chapters deal with the anatomy and development of the external and middle ear, marred by a few of the usual errors, but satisfactory in the main, as is the later chapter on the anatomy and physiology of the labyrinth. A chapter on etiology and history-taking is followed by a good summary of the methods and appliances for examining the ear, and 36 pages are given to the study of the naso-pharynx and Eustachian tubes, with the various methods of inflating the tympanum. Other measures of exploration and treatment are discussed in the sixth chapter, in which this treatise stands almost alone in insisting on a proper temperature of the water for syringing (100°–105°) [100°–115°, Rev.]. Diseases of the external ear are fairly dealt with in 100 pages, and 50 are given to the nasal and pharyngeal conditions affecting the ear. We must criticise his free use of cocaine; and from his remarks as to its shrinking effect on parts about to be cauterized or snared, feel that these measures are sometimes used in cases not demanding them. His advice is usually rational and judicious. The technique of removal of tonsils and adenoid overgrowths is quite explicitly given, general anæsthesia being held as requisite for the latter as it is needless for the former.

The author differentiates well the various forms of middle-ear disease, yet rather contradicts himself as to the purulency occasionally found in *catarrhal* otitis media. He treats of the operative interventions for chronic adhesive catarrh as though he were too skeptical of the results claimed to have made personal test of the procedures—an attitude rather justified by the changing views of the advocates of excision, etc. In chronic suppuration of the tympanum he trusts most to the dry treatment with boric acid, combined with all needful constitutional and hygienic measures. In mastoid involvement he uses leeches and cold, and believes in the efficacy of the Wilde incision, now generally lapsing into disuse. The operation of opening the mastoid is discussed at some length in its various aspects, with summarizing of the views of others rather than any digested personal teaching. The chapter on the intracranial extensions of aural suppuration is more systematic and concise, although, also, without reference to his own experience.

A good chapter on general and local diseases involving the ear is followed by one on traumatisms, and a very brief one on otalgia, for which atropia in dose of one-twentieth of a grain seems excessive. In a good but not exhaustive chapter on the Ménière group of symptoms he inclines to the view that they "originate in lesions affecting the brain or its membranes," although admitting some labyrinthine cases. He misses the point that they are due to *irritative* lesions, and, therefore, absent when *destruction* occurs. Auditory neuroses, electrical treatment, deaf-mutism, aids to hearing, and ear-disease in relation to life-insurance, occupy the closing chapters as in most text-books.

As to many parts there is a disappointment that the author has remained so non-committal and merely edited the statements of the best authorities; for close reading reveals many a little wrinkle that marks the careful, practical man, whose own experiences, even if not all-embracing, ought to be too valuable to be thus suppressed. B. A. R.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.A., M.D., LL.D.,

PROFESSOR OF CLINICAL MEDICINE AND THERAPEUTICS AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND HOSPITAL; VISITING PHYSICIAN TO ST. MARK'S HOSPITAL.

Suggestions for the Treatment of Gonorrhœa.

Drs. Bernard E. Vaughan and Henry T. Brooks, from a careful clinical and laboratory study of the gonococcus, conclude that there is evidence of (1) the etiological relation of the gonococcus to the gonorrhœal process; (2) the luxuriant growth of the gonococcus in acid media, its feeble or suspended growth in alkaline media; (3) the influence of temperature upon its development (growth being suspended at 104° F.); (4) the liability of infection from clothing. The influence of alkaline media and of temperature is especially to be regarded.—*Journal of Cutaneous and Genito-urinary Diseases*, 1895, No. 148, p. 18.

Magnesium Sulphate by Hypodermatic Administration.

Dr. James Wood seeks to explain the purgative action of this drug when given by hypodermatic injection. Saline purgatives have the power of exciting more or less the glands of the intestines and of causing them abundantly to pour forth their secretions. This drug in moderate doses accomplishes this without appreciably stimulating the peristaltic action. This being true, a part of the fluid poured out may be reabsorbed and carry with it into the blood a quantity of the salt, and also cause the contents of the bowel to lose their fluid or semi-solid consistency. This seems to be the explanation of its action when given hypodermatically, and an explanation of why we often see cases of constipation after the drug has been given *per rectum.* Two or three grains of neutral magnesium sulphate injected into the deep muscular layers of the nates in men, or into the calf of the leg in women, were successful in 70 per cent. of the cases; 20 per cent. required more than one injection, and in 10 per cent. the bowels failed to act. In nearly all cases the bowels moved within ten hours of the injection.—*Therapeutic Gazette*, 1895, No. 1, p. 9.

THE TREATMENT OF THE ALBUMINURIA OF PREGNANCY.

DR. HENRI HUCHARD insists that at the moment when a trace of albumin is found in the urine of a pregnant woman she should be placed at once upon an absolute and exclusive milk-diet until such time as the albumin has completely and definitely disappeared. If there is need of a purgative, it is better to prescribe calomel. If the patient is one who has passed albumin in preceding pregnancies, the milk-diet should be used as a preventive of albuminuria. Nor should it be forgotten that there may be an auto-intoxication even in the absence of albumin; therefore, when more or less marked symptoms of toxæmia arise, as headaches, vertigo, nausea, visual and auditory phenomena, and especially dyspnœa without apparent cause, this diet should be immediately prescribed. Watch the kidney which eliminates toxins, and the liver which arrests them, neutralizes them, and prevents their diffusion through the organism. The woman attacked by the albuminuria of pregnancy most certainly ought not to travel; the phenomena of genito-urinary excitation, which are normally produced by the jarring of a railway journey, can readily in these cases, when an old or subacute congestion of the kidneys exists, render the organs impermeable and promptly produce fatal results. Beyond this, repose, absolute or relative, is essential, and no drugs should be prescribed.—*Journal des Praticiens*, 1895, No. 1, p. 3.

THE MECHANICAL TREATMENT OF ANASARCA.

DR. H. SCHURZ states that three methods are employed: 1, simple incision: 2, aspiration with trocar; and, 3, drainage by means of a funnel. For the last two methods it is important that the surface to be drained should be treated according to surgical principles. The incision should be dressed with gauze moistened with a sublimate solution, and over this should be laid a thin cotton-dressing. The patient should remain in a sitting position with feet dependent by day and by night in a horizontal position, the escaping serum being received in rubber tissue, which will conduct it into the receptacle. The dressings should be changed every twenty-four hours, and the edges of the wound anointed with vaseline.—*Therapeutische Monatshefte*, 1895, Heft i. S. 1.

BISMUTH SUBGALLATE.

DR. O. WIEMER has found that it is characteristic of this drug that it accelerates the healing of wounds, unites the wounded surfaces, and is entirely free from any symptoms of irritation on the part of the tissues, the result being the "dry treatment" of wounds. In ordinary disinfection by means of irrigation considerable irritation necessarily results, and, as a consequence, discharge from the wound. The use of every substance and method likely to cause irritation should be avoided, and cleanliness and measures tending to prevent the access of germs encouraged. The remedy is used in substance as dusting-powder and as a 10 per cent. gauze, the latter possessing the advantage that it can be sterilized in steam at 212° F. without destroying its antiseptic properties. Before the operation all dressings, compresses, and material are sterilized in a Lantenschläger's apparatus. During the operation antiseptics are excluded; the blood is removed by pledgets of the gauze above mentioned and the hemorrhage checked by the most painstaking care, so that the wound is absolutely dry. The powder is then used, being thoroughly rubbed in, and the gauze applied. The drug seems to be absolutely non-poisonous, 150 grains administered by the stomach-tube to rabbits and dogs being absolutely harmless. On the other hand, an instance is reported where serious symptoms followed the use of this drug in the peritoneal cavity after cœliotomy, due presumably to its use when absorption is energetic; but these symptoms were those of bismuth-poisoning and analogous to those observed when bismuth subnitrate has been used as an antiseptic.—*Therapeutische Monatshefte*, 1895, Heft i. S. 15.

THE PHYSIOLOGY OF NICOTINE.

MM. GRASSET and PARENTZ have studied nicotine oxalate, which is eight times less toxic than nicotine. The constant symptoms were contraction of the pupils, paralysis and convulsions, salivation, cerebral anæmia, peripheral vaso-constriction, cardiac asystole. By acquiring a tolerance animals could bear a dose larger than one ordinarily toxic.—*Journal des Praticiens*, 1895, No. 12, p. 30.

THE TREATMENT OF GONORRHŒA.

DR. M. HOROVITZ states that during the first few days after the appearance of the symptoms a local application of a 10 per cent. silver nitrate solution through a short endoscope, after a preliminary cocainization of the urethra, this repeated upon the next day, and later followed by an astringent injection, has resulted, in a few cases, in cure. In very sensitive urethras a 2 per cent. solution of potassium permanganate may be successfully substituted for the silver nitrate. For use as an injection various remedies are useful: Zinc sozoiodolate (1–2 : 100); zinc sulphocarbolate (0.5–1 : 100); potassium permanganate (0.05–0.1 : 100); silver nitrate (0.1 : 300); corrosive mercuric chloride (0.01 : 300); and ichthyol (5 : 100). Solutions of resorcin which are brought into contact with the mucous membrane for a sufficiently long time produce an exfoliation, and thus may lead to an evacuation of the gonococci. The injections should be used for three or four weeks, three or four times daily, and the solution retained in the urethra for one or two minutes. Later the number of injections can be diminished. With lessened discharge, the 3 per cent. alum or 1 to 2 per cent. tannin solution, to which red wine has been added, are useful. A watery and persistent discharge may be successfully treated by aqueous suspensions of bismuth subnitrate, salol, or iodoform. In posterior urethritis local treatment to this portion of the canal is necessary. Dittel's or the modified Lallemand caustic-carriers, or the Durtment syringe of Tommasoli, are useful.—*Centralblatt für die Gesammte Therapie*, 1895, Heft 14, S. 1.

THE ACTIVE PRINCIPLE OF CEREUS (CACTUS) GRANDIFLORUS.

MR. J. B. NAGELVOORT quotes Sharp as stating that glucosides and alkaloids are absent in the plant. His personal investigations, carried out as general methods, including "characteristics for many glucosides," of plant analysis, showed that the fluid extract did not yield an alkaloid.—*American Journal of Pharmacy*, 1895, No. 1, p. 31.

THE ELIMINATION OF MEDICINAL SUBSTANCES BY THE GASTRIC MUCOUS MEMBRANE.

DR. PAUL BINET states that the gastric mucous membrane normally eliminates a large quantity of chlorine, especially under the form of free hydrochloric acid during digestion or in the state of the alkaline chlorides. An intravenous injection of sodium chloride notably increases the proportion of fixed chlorine in the stomachic contents. The passage appears to be less easy when the chlorine is held in an oxygenated combination, as in the alkaline chlorates. Iodine and bromine injected as alkaline iodides and bromides easily pass into the stomach, and their elimination lasts several days after the injection. Antimony, however, after either intravenous or subcutaneus injection, cannot be determined to be present by either the Marsh test or by electrolysis between zinc and platinum, so that its passage into the stomach is not a constant phenomenon. As for lithium, traces have been found in the water removed from the stomach by lavage after a subcutaneous injection of fifteen grains of lithium chloride. The results of the investigation of strontium have been negative, while those of magnesium have been doubtful. In the last case the quantities obtained have been too small, even after an intravenous injection of one hundred and fifty grains, to admit that these are not the result of accident or of contamination of the food. These investigations are important not only as showing how it is possible for reabsorption to take place, but as well to demonstrate that in certain cases of poisoning washing of the stomach may be employed with benefit, even if the poison has not been taken by the mouth, as, for instance, when given hypodermatically or *per rectum.*—*Revue Médicale de la Suisse Romande*, 1895, No. 1, p. 5.

THE USE OF HYDROCHLORIC ACID IN GASTRIC DISEASES.

DR. HENRI HUCHARD believes that this remedy possesses two important properties—eupeptic and antiseptic. As to the former, it supplies to the gastric juice the acid which is wanting, and therefore it is indicated in all conditions in which hydrochloric acid is diminished and with greater reason when it is absent. In the latter case by its presence it can render the pepsin active which otherwise would be inert. This drug is indicated in delayed digestion, deficient secretion of hydrochloric acid, chronic gastritis, cancer of the stomach, in the pyrexias, which almost completely suppress its secretion, in pulmonary tuberculosis, in under-compensated hearts, especially in chlorosis and anæmia, and in certain conditions of the nervous system, as neurasthenia. It is contra-indicated in hypersecretion, gastro-succorrhœa, ulcer, acute gastric affections, in cancer secondary to round ulcer, nervous dyspepsias of the neuropathic and hysteric. Its use should be continued for three or four weeks, omitted for a fortnight, to be again renewed. Large doses, as those recommended by Ewald, fifteen drops three or four times after meals, at quarter-hour intervals, are to be avoided. As an antiseptic it prevents abnormal fermentations and the production of organic acids. It is indicated in dilatation, in certain forms of gastric cancer, in all gastric conditions characterized by fermentation, and in pyrosis due to the formation of acids due to fermentation. In these cases, administer it some hours after meals. As an eupeptic give it during and after the meal. To combine these two effects exhibit one dose immediately after and a second one three or four hours later. —*Journal des Praticiens*, 1895, No. 7, p. 97.

THE TREATMENT OF NERVOUS VOMITING.

DR. TISSERAND (*Thèse de Paris*) prescribes the use of ice internally as well as externally, or, in place of the latter, a spray of ether. A one per cent. chloroform-water, four per cent. solution of lactic acid, ten to fifteen drops of tincture of iodine, or revulsives to the epigastrium, may be tried. If these means fail, the patient may be nourished by the œsophageal tube, which will usually succeed with hysterical and neurasthenic individuals. In paroxysmal vomiting these remedies fail, and recourse must be had to strong doses of morphine or of cocaine, or even administered hypodermatically. Atropine sulphate in dose of one hundred and twenty-eighth of a grain has been recommended. If there is hæmatemesis, an ice-bag externally and ferric chloride, and especially ergotin, are to be prescribed. If the cause can be ascertained, sodium bicarbonate for the excessive amount of hydrochloric acid, or if there is excessive secretion, lavage may be useful. In neurasthenia and hysteria the aid of hydrotherapy or suggestion may be invoked. If the vomiting is reflex, find the cause: give purgatives if there is digestive torpor; anthelmintics for worms; induce abortion for the uncontrollable vomiting of pregnancy.—*Journal des Praticiens*, 1895, No. 6, p. 90.

TREATMENT OF PAINFUL DYSPEPSIA.

The editor notes the usefulness of the term dyspepsia, although it lacks definiteness. For the sensation of distention, most frequently associated with pains in the præcordium, occurring in neurotic persons, and generally termed "nervous indigestion," a combination of chloral, one-half to one drachm, sodium hyposulphite, one to two drachms, and peppermint-water to three ounces, administered in teaspoonful doses after meals,has proved to be useful. The chloral acts as an antiseptic and nervous sedative, as does also the sodium hyposulphite; and peppermint-water, if freshly prepared, possesses all the antiseptic properties common to the volatile oils, in addition to its slight local anæsthetic and stimulant properties.—*Therapeutic Gazette*, 1895, No. 2, p. 86.

BROMETHYLFORMINE.

DR. LEOP. LAGNER notes the search after combinations of bromine with organic bodies which shall possess the properties of the metallic bromides without their unpleasant secondary effects, as furunculosis and fetid breath. This combination was obtained by Trillat from bromethyl and formine and is a bromethylate. It is colorless, crystallizing in scales very soluble in water, and in this solution is free from the disagreeable taste of the metallic bromides. Its composition is given as $(CH_2)_6N_4C_2H_5Br$, and contains 32.13

per cent. of bromine. The dose is double that of potassium bromide. Because of its ready solubility it can be administered in water or in the preparations of peppermint, valerian, etc. Thus far it appears to be a safe and efficient substitute for the metallic bromides.—*Les Nouveaux Remèdes*, 1895, No. 2, p. 32.

THE TREATMENT OF MERCURIAL TREMOR BY HYOSCYAMINE.

DR. H. BRUGER (*Thèse de Paris*) has reported the results of his observations of the use of this remedy. The method recommended by Oulmont consisted in prescribing each day two pills of the drug each containing one-sixty-fourth of a grain, and in doubling this quantity every two days until the maximum of ten to twelve times the original dose was taken. These large doses produced pharyngeal irritation, mydriasis, mild delirium, and diarrhœa; serious inconveniences which prevented its universal adoption. Cuffer, on the other hand, never exceeded one-sixteenth in the milder and one-sixth of a grain in the severer forms, and exhibited the drug between meals. This time of administration was selected to avoid digestive and salivary disturbances. It was found to be advantageous to prescribe a milk-diet and to employ sulphur baths to aid in the elimination of the mercury. There were no toxic symptoms, and diminution of the tremor followed in twenty-five to thirty days, after which the use of the limbs was recovered, and complete cure resulted in six to eight weeks. This drug is active and dangerous, but moderately cumulative, but in small doses extended over a considerable period of time one avoids these inconveniences.—*Journal des Praticiens*, 1895, No. 5, p. 74.

THE USE OF ALCOHOL IN DIABETES.

DR. FELIX HIRSCHFELD concludes that in the amount of one or two ounces alcohol is completely oxidized in the organism of the diabetic. The amount of urine is not increased nor the absorption of aliment influenced. The albuminous metabolism, on the contrary, is markedly increased, and as a result the general nutrition is improved. Upon the tissue-changes peculiar to diabetes, the glycosuria, the acetonuria, and the lessened absorption, alcohol is without influence. The unfavorable action of alcohol in its possible injurious action upon the heart and bloodvessels is to be considered. Especially in an accompanying albuminuria is the danger of renal irritation present. The use of alcohol in severe cases of diabetes is necessary that we may avoid and limit the supervening failure of strength and development of tuberculosis from insufficient nutrition. In mild cases of glycosuria, only the property of alcohol as a *genussmittel* is to be considered, and then occasionally in moderate amount —*Berliner klinische Wochenschrift*, 1895, No. 5, p. 95.

THE COMPARATIVE ACTIVITY OF DIGITALIN AND DIGITOXIN.

DR. E. BARDET, from a study of the French crystallized digitalin and the German digitoxin, has arrived at the following conclusions: 1. Crystallized digitalin, so-called chloroformic, is the only one of the products derived from digitalis which represents a really definite principle and one of constant action and well recognized from a therapeutic standpoint. 2. Digitoxin is not, as has been alleged, a principle identical with the crystallized or even the amorphous digitalin, but is a non-crystalline amorphous mixture of indefinite composition. Its activity is variable, and may be equal or even two or three times stronger than the crystallized digitalin. 3. The amorphous digitalin, so-called chloroformic, contains, as well as the digitoxin, a body, probably a glucoside, of considerable but of varying activity. 4. There is a great practical advantage in maintaining in the pharmacopœias only those definite bodies of constant activity: consequently the crystallized digitalin, so-called chloroformic, being the only definite active principle of digitalis, ought to be the only one prescribed. 5. The Therapeutic Society ought to see to it that the French Codex should suppress the amorphous digitalin and admit only the chloroformic crystallized digitalin.—*Les Nouveaux Remèdes*, 1895, No. 2, p. 27.

URÆMIC AND DROPSICAL COMA.

DR. BENJAMIN WARD RICHARDSON states that in the acute cases there can be no doubt as to the value of bloodletting from a vein; even a feeble pulse ought not to prohibit it. Judiciously applied it is free from danger; it does not lead to collapse or shock; relief from the symptoms is, as a rule, immediate. When there is dropsical exudation with deep coma, bleeding is still a sound and correct remedial measure, although never very hopeful. It seems to give relief, but nothing more. When there is extensive exudation, with a comatose tendency, owing to fluid-pressure, bleeding need not be contended for. Artificial removal of the fluid by tapping is here of the greatest service. Diuretics have been found to be capricious and doubtful as positive means. Diuretin in one case increased the flow of urine to one hundred and seventeen ounces in twenty-four hours, but it had to be stopped owing to its production of a rapid and feeble pulse with marked prostration. The fluid can be removed by aspiration from the thorax, by the trocar from the abdomen, by Southey's tubes from the lower limbs, the comatose tendency being always relieved by reduction of pressure. In deciding upon treatment, temperature plays an important part. If it be above normal, *cæteris paribus*, there is no need for a moment's hesitation about the performance of venesection; if it be normal, although some dropsy be present, there need be but little hesitation about bleeding; but if the temperature be below normal, with dropsy, then venesection could not be expected to render the least service, it might, indeed, be a dangerous process by inducing a superfluous flow of water into a blood already attenuated. The point of practice in such a case is to draw off the effused fluid upon the pressure from which the coma is dependent. —*The Asclepiad*, 1894, No. 42, p. 113.

THE TREATMENT OF DIPHTHERIA.

MR. LENNOX BROWNE, while not rash enough to dogmatize, where others have hardly dared to theorize, suggests that antitoxin acts by promoting a local capillary thrombosis at the site of the exudation, which at once leads to a shedding of the deposit, to destruction of the bacilli, and to a blocking of the channels against toxic absorption, the general system being at the same time improved by an increased metabolism of the toxic products, thereby leading to an improvement in the quality of the blood. This explanation would also account for the failure of antitoxin when adopted too late to prevent absorption in a system too weakened to withstand further calls on its vital processes. The advantages of this treatment are that it acts with more rapidity than any other in arresting the development of membrane, assisting in its detachment, and hastening the disappearance of the bacilli, with a corresponding relief and improvement in the general condition, as notably instanced by the prompt disappearance of the adenitis, one of the most strongly marked objective evidences of toxæmia. The accumulated evidence of Hanseman, Baginsky, Ringer, Washbourn and Goodall, Benda and Monti, agrees with the writer's experience, which inevitably leads to the conclusion that there is an increased tendency to nephritis, cardiac failure, and septicæmia in cases treated with this remedy over what was formerly observed under the old treatment. Recognizing the importance of the older methods of treatment, these should by no means be omitted at the present time. The warnings that under the use of antitoxin there is an increased susceptibility to heart-failure, nephritis, and general septicæmia must be interpreted as indicating that at the earliest indications of cardiac weakness analeptic and stimulating treatment must be commenced and persevered in. Renal activity must be assisted. Every precaution must be taken against sepsis from whatever source that might increase the liability to erythemal and joint pains, evidently of a toxic character and out of proportion in frequency of occurrence to what has been hitherto observed. It must not be forgotten that in diphtheria, as in all other specific fevers, an epidemic may occur of such a malign type, or perhaps in individual cases the disease may be exhibited, from the first onset, in so grave an aspect that no remedy whatever can occasionally avert a fatal issue. To suppose that antitoxin, either with or without other measures, excellent though they may be and however promptly applied, will place the percentage of mortality under such circumstances in a more favorable position than that of enteric or scarlet fever is nothing short of Utopian.—*Medical Press and Circular*, 1895, No. 2910, p. 157.

Dr. Th. Hoyntschak reports an instance in which he used Behring's antitoxin and noticed profuse perspiration, urticaria, pains in hands and feet, swelling of these joints, eruption resembling peliosis rheumatica. Recalling the similar cases of Asch and of Lublinski, he inquires what is the exciter of so evident an infection and how it is that it comes into the remedy? The symptoms point very plainly to an infection.—*Wiener klinische Wochenschrift*, 1895, No. 4, p. 61.

Dr. O. Soltman reports 193 cases. In four months, without antitoxin, 28 of 71 children died, *i. e.*, 39.8 per cent.; in five months, when the majority of cases were treated by antitoxin, 22 of 122 died, *i. e.*, 18 per cent. He notes the occurrence of albuminuria in 26 cases, and in direct connection with the injections 19 times. Exanthemata were frequently observed; for instance, urticaria generally in the locality of the injection, also, six to eight days thereafter, a scarlatiniform eruption resembling a drug-eruption, but to be distinguished from that of scarlet fever. This was generally limited to the back, nates, and lower portion of the abdomen, was not accompanied by rise of temperature, nor followed by desquamation; the scarlet-fever tongue was absent. True scarlet fever accompanied the diphtheria nine, and measles three times. Post-diphtheritic paralysis, slight palatal paralysis being excepted, was noted five times, four of these being in children who had received this remedy. In three cases after complete disappearance of all local symptoms relapses followed. One child who had been rendered immune became ill three weeks after injection with a genuine but mild diphtheria. Since Behring's antitoxin contains one-half of one per cent. of carbolic acid, in an injection of one hundred and fifty to three hundred minims we have from five-sixths to more than a grain of carbolic acid, which is a maximum dose for an adult. Recognizing the effects of this amount of carbolic acid on pulse, temperature, and kidneys, the author is strongly of the opinion that this antiseptic must be omitted from the remedy.—*Deutsche medicinische Wochenschrift*, 1895, No. 4, p. 53.

Dr. A. L. Mason states that the indications for treatment are clear, and point to such measures as will save and maintain the strength of the patient, with the discriminating use of those local applications which tend to check or neutralize toxic absorption and to prevent invasion of the respiratory tract. Tincture of ferric chloride, oxygen, and alcohol in large doses, have met with professional approval to correct toxæmia and to sustain the flagging heart. They are absolutely ineffectual in cases of the more septic type. The same is true of strychnine, strophanthus, and digitalis. Care must be taken in the administration of food and medicines, both on account of the distress which the patient experiences in his efforts at deglutition and the danger of strangling or of broncho-pneumonia from the entrance of food into the air-passages. Systematic feeding by a soft-rubber catheter passed through the nostril into the gullet sometimes saves life. For local treatment mild carbolized sprays, such as Dobell's lime-water, warm alkaline solutions, chlorine-water, or hydrogen peroxide, the latter in ten or fifteen-volume solution or stronger, once or twice daily for a few days, for the removal of the membrane.

Dr. E. M. Buckingham among other means of treatment places great reliance upon the combination of fresh air and sunlight. For local treatment spraying seems to be the only practicable way of making these applications to children, but it should be done with the greatest gentleness. Hydrogen peroxide is of value, but it has been over-estimated. The fifty-volume spray, while seldom a caustic, is too strong for routine use if the object is merely to clean the mouth and not to exterminate the bacilli. Any appreciable strength is too strong for the nose. It has here the additional disadvantage that it probably penetrates the nose far less than most applications, because it sufficiently fills the nostrils with foam to prevent the passage of a gentle spray. There is no objection to the use of a fifteen-volume solution in the mouth. For the nose insufflations of iodoform are used, first clearing the way, if necessary, with forceps or a spray of sterilized water.—*Boston Medical and Surgical Journal*, 1895, vol. cxxxii. p. 145.

Dr. F. H. Williams states that the strength of the hydrogen peroxide solution which is to be used depends entirely upon the conditions which present themselves; the twenty-five-volume solution may be serviceable, or the fifty-volume solution may be required. Never use force under any circumstance. Once in three hours is sufficiently often for local applications, later once in four hours, or less often. The friction of the solutions chiefly causes the discomfort. It is important that efficient instruments should be used. The solutions should be of known strength and have a sufficient amount of hydrochloric acid, which, so far as the germicidal action goes, is the active agent rather than the hydrogen peroxide itself. The hydrochloric acid should be in small percentages, one-fifth of one per cent.—about as much as there is in the gastric juice. The pressure of the air for spraying should be about six, or at most eight, pounds to the inch. Cultures should be made from the throat after a few days, and if the bacilli of diphtheria are absent, local treatment, as a rule, may be stopped.—*Ibidem*, p. 160.

THE PREVENTION OF CONSUMPTIVE DISEASE.

DR. BENJAMIN WARD RICHARDSON promulgates the following as a sanitary decalogue: 1. Pure air for breathing is the first rule for the prevention of consumption. 2. Active exercise, outdoor as much as possible, is essential. 3. Uniform climate is important. 4. The dress should sustain uniform warmth. 5. The hours of rest should be carefully regulated by the sunlight. 6. Outdoor occupation is preventive. 7. The amusements should favor muscular development and sustain healthy respiration. 8. Cleanliness in the broadest sense is of especial moment. 9. Every precaution should be taken to avoid colds. 10. The diet should be ample with full proportion of the respiratory foods.—*The Asclepiad*, 1894, No. 42, p. 147.

THE POSTURE OF THE HEAD IN ACCIDENT WHEN THE PATIENT IS UNDER AN ANÆSTHETIC.

DR. H. A. HARE has carefully reviewed the work of Howard, and from his studies concludes that the epiglottis is not the cause of the obstruction in arrested respiration in anæsthesia. If, however, the head is extended and simultaneously projected forward, both the tongue and the epiglottis are raised, and the soft palate is so drawn as to permit of free breathing through the mouth as well as the nose. As to the question of the various methods of performing artificial respiration, that of Sylvester is believed to be by far the best. It is, however, vitally important to have an assistant grasp the feet and hold them motionless, since in this way the extension and upward traction of the arms above the head elevate and dilate the chest. This particularly is the case in children and persons of small weight, as the lower segment of the body readily follows the chest in its upward movement.—*Bulletin of the Johns Hopkins Hospital*, 1895, No. 46, p. 1.

OIL OF TURPENTINE AS A HÆMOSTATIC.

DR. J. SASSE recommends this remedy applied upon cotton to check the bleeding after extraction of teeth. In a case of scorbutus it was used in a two per cent. solution as a mouth-wash, and later undiluted, the gums being painted with it every hour, and a small quantity was given internally. In one instance a vesical hemorrhage, which had resisted salol, boric acid, and uva ursi, was successfully treated by dessertspoonful doses of one-half of one per cent. emulsion of the drug.—*Therapeutische Monatshefte*, 1895, Heft 2, S. 83.

MEDICINE.

UNDER THE CHARGE OF

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The Blood in Chronic Cyanosis.

In studying the blood of eight cases of chronic cyanosis from congenital heart-disease, Vacquez (*Comptes Rendus de la Société de Biologie*, March 8, 1895) found marked changes. In all cases the number of red corpuscles per cubic millimetre was increased, the increase being in direct ratio to the intensity of the cyanosis.

Besides the increase in the number of the red corpuscles, an increase in size was also noted, though not until the cyanosis had become quite marked; in fact, in the earlier years of cyanosis the increase in number was only relative.

In individuals of from twelve to twenty years of age blood-counts of from 5,600,000 to 6,300,000 were found, the diameter of the corpuscles varying from 7.9 μ to 12 μ.

Vacquez does not think that the increase in number of the corpuscles was parallel to the increase in diameter, but thinks that both are due to the same cause.

At the same time with the increase in size and number of the corpuscles there is an increase in the amount of hæmoglobin in each individual corpuscle, so that the hæmoglobin does not show its normal relation to the number of corpuscles.

The question as to whether the increase in size of the corpuscle or the increase in hæmoglobin is the primary process cannot well be answered. The process has been explained on the grounds that in cyanosis the supply of oxygen carried to the tissues is insufficient, and that the corpuscular new-formation is compensatory.

Gibson (*Lancet*, January 5, 1895) reports a case of a boy, aged eight years, whose red blood-corpuscles were 8,470,000 per c.cm., and the hæmoglobin 110 per cent. He refers to other instances in which this increase in the blood-corpuscles has been noted, and suggests the following interesting explanasion: "In venous stasis the corpuscles are insufficiently oxygenated; they cannot perform such an active part as oxygen-carriers, and they cannot yield too much oxygen to the tissues. It must further be remembered that in cyanosis there is less metabolism in the tissues, and therefore less waste produced. In a word, the functions of the corpuscles being lessened, the tear and wear which they undergo are reduced and the duration of their individual existence increased. The number of the corpuscles must in this way be proportionately augmented, and this must lead to the numerical increase as well as to the high percentage of hæmoglobin, until a balance is struck between the production and the destruction of the blood-corpuscles."

EARLY DELIRIUM IN TYPHOID.

ASCHAFFENBOURG (*Archives de Neurologie*, March, 1895) reports the case of a female, aged thirty years, who entered the hospital in a state of great agitation, with disordered ideas of a very marked character, so that she was incapable of understanding what was said to her. She had insomnia, hallucinations, and walked as if drunk. The pulse was rapid.

The hallucinations, as well as the agitation and the intellectual obtuseness, became more and more marked, and reached their height about the fifth day. At this time, the evening temperature being 38.4° C., typhoid fever was suspected, and the symptoms soon became typical. The delirium disappeared, but the patient gradually sank and died in collapse. The autopsy confirmed the diagnosis.

Out of seventeen cases of early delirium in typhoid in the literature, in seven the delirium preceded the fever—the latest period at which it was observed being the end of the first week, the delirium lasting, as a rule, only a few days. Six patients of the seventeen reported died. Early delirium in typhoid presents itself under two forms, both of which have as a common symptom great intellectual obtuseness.

In the one form we have delirium similar to that seen in the later stages of the disease. The patients imagine that they are being electrified, etc.; they are restless and at times violent, or perhaps may be in a condition of torpor. Very often there is a primary stage of agitation followed by a stage of torpor.

In the second form there is absolute confusion both of the ideas and actions. The patients sing, pray, or dance, and may be either gay or depressed. As to causation, Aschaffenbourg inclines to the view that the typhoid bacilli secrete a poison which has the power of diminishing the body-heat and exciting the cerebral cortex like a narcotic alkaloid.

HÆMOGLOBINURIA FROM MUSCULAR EXERTION.

LEE DICKINSON (*Clinical Society's Transactions*, 1894) reports three interesting cases of hemoglobinuria from exertion. All of the cases occurred in young, healthy individuals after severe exertion, the hæmoglobinuria being transitory and unaccompanied by any other symptoms, except in one case where there was slight frequency of micturition.

The author points out that there exists a condition which may be called functional hæmoglobinuria, in which there seems to exist an abnormal liability of the blood-corpuscles to destruction, the hæmoglobinuria occurring on very slight exertion.

In his cases, however, the normal blood was destroyed, the hæmoglobinuria here produced being comparable to that occurring in burns and after certain poisons.

A case is mentioned in which, in a boy dying during a run, the only pathological lesion found was a disintegration of the red corpuscles; the author suggests that had the boy lived long enough he would have presented hæmoglobinuria, and that his cases differed from this only in degree.

The hæmoglobinuria in these cases is explained by the destruction of the red corpuscles in the circulation and the subsequent elimination of the hæmoglobin by the kidneys.

How the blood-disintegration occurs is not fully known, but carbonic acid is probably largely concerned in the process, as it is known that this gas, in excess in the system, may profoundly modify the blood and the tissues associated with it. Cyanosis did not, however, accompany the over-exertion in all the cases.

LEUCOCYTOSIS IN HYPERTROPHIC CIRRHOSIS OF THE LIVER.

In a short note on this point HANOT and MENNIER (*Comptes Rendus de la Société de Biologie*, February 1, 1895) call attention to the fact that they have always regarded this disease as of an infectious nature, and consider the leucocytosis as further evidence of infection.

They cite five cases of hypertrophic cirrhosis with chronic icterus, in each of which blood-counts were made on various occasions, and an excess of leucocytes always found. In none of these cases was there any extra hepatic inflammation which could cause a leucocytosis.

The examinations showed that the number of leucocytes per cubic millimetre varied from 9000 to 21,800; that is to say, an average of 15,000.

The blood-count of a number of cases of alcoholic cirrhosis showed an average of 6600 leucocytes per cubic millimetre.

The authors conclude that hypertrophic cirrhosis is the only disease of the liver in which a leucocytosis is present, except carcinoma, in which they have found as many as 40,000 white corpuscles to the cubic millimetre.

CONFUSION BETWEEN DISTENDED GALL-BLADDER AND MOVABLE KIDNEY.

HENRY MORRIS (*British Medical Journal*, February 2, 1895) points out that though on first thought there is not much resemblance between these two affections, the one is often confounded with the other.

The fact that both affections are much more common in women is noted, and the fact that the right kidney is much more movable than the left increases the chances of error. The symptoms common to both are pointed out.

Both may present as a tumor in the right hypochondriac and umbilical regions, and the physical characteristics of the tumor from either cause may be similar. The tumor may be movable in either case, and in either case the percussion-note overlying it may be resonant or dull. Both diseases may cause dyspeptic symptoms or give rise to colic. Either may cause jaundice, gastric intestinal catarrh, or even peritonitis. In neither case is the condition of the urine a reliable guide. The conditions of the gall-bladder, which tend to render the confusion more probable, are elongation with a reniform outline, mobility, or downward displacement of the liver, with a retroflexed gall-bladder under the viscus, causing the displaced bladder to feel like a loin rather than an abdominal tumor.

A tilting of the kidney from behind forward, bringing its anterior end just under the abdominal parietes, or adhesion of the kidney to the right lobe of the liver might cause the kidney to resemble gall-bladder.

To distinguish between the two conditions it must be remembered that a distended gall-bladder, as well as the kidney, is a frequent cause of *movable* abdominal tumor. The range of motion in the gall-bladder is, however, always in the arc of a circle, the centre of which is a point beneath the right lobe of the liver. The history of a distinct attack of jaundice is an important factor in diagnosis. A distended gall-bladder can generally be felt, whereas a movable kidney often cannot. The gall-bladder, if distended with stones, is much harder than the kidney.

Variance in size of the tumors is of no importance, unless with the variance in size there is the history of the passage of large quantities of urine.

An attempt should always be made in these cases to pass the hand behind the tumor and palpate the kidney.

DIPHTHERIA ANTITOXIN.

KUNTZEN (*Deutsche medicinische Wochenschrift*, 1894, No. 49), in reporting the results of the use of Behring's antitoxin in diphtheria, emphasizes some things worthy of general attention. In the first place he criticises the custom of classifying cases as "mild," "moderately severe," and "severe," since the prognosis often varies from hour to hour. Behring and his collaborators laid special stress on the value of the serum in cases treated early; and in the report on 220 cases by Ehrlich, Kossel and Wassermann, the latter classified their cases according to the day of the disease on which the treatment was begun, showing that the death-rate, which was 0 in cases treated on the first day, increased from 3 per cent. on the second to 14, 23, 43.5, etc. If future results are published in this way, the value of the remedy can be more definitely determined. Kuntzen himself treated twenty-five cases and lost only three. Five required tracheotomy, and of these, two died. Kuntzen followed Behring's method of treatment, giving 600 immunizing-units to children on the first or second day of the disease; to children coming under treatment later, or adults, twice that dose.

HAGER (*Centralblatt für innere Medicin*, 1894, No. 48) reports twenty-six cases of diphtheria treated with Behring's serum in private practice. The diagnosis was controlled by bacteriological examinations. One case proved to be scarlatinous and ended fatally. Of the twenty-five cases of true diphtheria one died. This was a child of eight months, almost moribund when first seen, and requiring tracheotomy before the injection was made. The child lived four days; the local condition improved, but death occurred with increasing weakness and with bronchitis. The other cases were classified as follows: Mild, 8 cases; moderately severe, 6 cases; severe, 10 cases. The dose of antitoxin varied from 250 to 2500 or more immunizing-units, on the average 1000 to each case. The usual course of the disease after the injection was so characteristic that Hager could not doubt the effect of the remedy. A day after the injection the general sensation improved; after two days the fever usually subsided; after three days the pulse was less frequent. After one day the membrane appeared sharply defined, and usually by the fourth day it had disappeared. Serious consequences were not observed. The local reaction was slight. In five cases an urticarial erythema occurred around the point of injection, in one case at a distant point. Thirty-five children in infected families received prophylactic treatment. Of these, four acquired diphtheria. One recovered after an injection of 500 units, two without treatment (the treatment of the fourth is not mentioned).

Hager calls attention to the importance of using the serum in private practice, not only on account of the possibility of beginning early, but also on account of the lessened danger of severe complications (especially streptococcus infections) so common in hospitals.

MOELLER (*Ibid.*) reports briefly the results of the treatment of diphtheria with and without serum in the Magdeburg (Altstadt) Hospital. The serum was not used in mild cases, nor in cases brought in moribund. Owing to this and the fact that mild cases were admitted to the hospital in unusually large numbers, the author does not feel permitted to draw conclusions. Of the cases in which tracheotomy was performed, those treated with serum had a mortality of 39.6 per cent., and those without it, 55.6 per cent. The death-rate of the former is the lowest yet reached in the institution, but it is drawn from a comparatively small number of cases (41).

The author thinks that in comparing results those of tracheotomized patients are most reliable; but considering the almost hopeless condition in which this operation is often done, the conclusion does not seem a proper one.

PERFORATION OF THE DIAPHRAGM IN GASTRIC ULCER.

L. PICK, in reporting a new case, gives an analysis of all cases published in which ulcer of the stomach caused perforation of the diaphragm (*Zeitschrift für klinische Medicin*, Bd. 26, H. 5 and 6). In all, twenty-eight cases were discovered; but the author thinks that other cases, proved by autopsies, have been observed, and also that in certain cases of so-called idiopathic suppurative pleurisy or pericarditis gastric ulcer was the cause. (In regard to this, however, Biach has shown that in 918 cases of pyopneumothorax only two were due to ulcer of the stomach.) According to Pick, perforation of a gastric ulcer into the thoracic cavity is twice as frequent as adhesion to and perforation of the anterior abdominal wall. The commonest outlet is in the pleura or lung, and affected the left pleura nine times, the left pleura and lung seven times, and the right pleura once. In the latter case the perforation was consecutive to subphrenic abscess. The pericardium was affected alone in six cases, and the pericardium and heart in four. In one case the mediastinum was affected, and in the author's case the anterior thoracic wall, with the formation of a tumor in that part. In twenty cases the perforation was direct, and in eight indirect, or following subphrenic suppuration. In this conclusion the author differs from Brinton, who studied a smaller number of cases. Pick's analysis shows that the rare ulcers of the fundus are much more likely to rupture into the thorax than those of all other parts of the stomach, but that the occurrence of thoracic complication depends largely on the existence of old adhesions and alterations in the position of the thoracic organs. The exciting cause of the perforation in most cases is mechanical, either by distention from food or gas, vomiting, straining at stool, etc.

Death is usually due to complications, rarely to shock. Perforation of the heart does not cause instant death, patients having lived as long as three or four days after hemorrhage began.

SULPHURETTED HYDROGEN IN DILATED STOMACH.

ZAWADZKI (*Centralblatt für innere Medicin*, 1894, No. 50) reports four cases in which sulphuretted hydrogen was produced in stomachs which were dilated, but contained considerable quantities of free hydrochloric acid—as much as 0.2 per cent. This occurred only when the stomach-contents were retained more than twenty-four hours. Notwithstanding the large amounts of H_2S in the stomach, none appeared in the urine. This fact, and the absence of symptoms of intoxication, the author explains by failure of absorption, or by a neutralization of the poisonous products of putrefaction. Part of the H_2S is removed by eructation—in one case the patient had to be isolated on account of the odor—part passes on into the duodenum. The exact cause of the putrefaction in such cases must be left to future investigations.

FACIAL PARALYSIS.

L. MANN (*Berliner klinische Wochenschrift*, 1894, No. 53) calls attention to the fact that in facial paralysis of peripheral origin the muscles are not equally affected. In two cases, undoubtedly peripheral, the orbicularis oris remained intact while all the other muscles supplied by the facial were completely paralyzed. The electric reactions of the orbicular muscles were practically normal, the patients could contract them at will; but on account of the paralysis of the other muscles of the face the angle of the mouth was drawn to the sound side in both cases. Opening the mouth was accomplished by the muscles of the unaffected side. Mann had previously observed in facial palsy that the orbicularis palpebrarum, analogous in function to that of the mouth, was not so seriously affected as the other muscles. The difference was especially clear in cases with partial reaction of degeneration. In recovery the orbicularis recovered earlier than the other muscles, so that the patients could close the eye long before they could wrinkle the forehead. Whether a similar early recovery of the orbicularis oris takes place the author has failed to observe; but Landois and Mosler have described a case in which the functions of the orbicularis of the mouth and eye returned before the others in facial paralysis. Hitzig has observed a relatively early regeneration of the orbicularis palpebrarum, and both he and Bernhardt hold that the orbiculo-frontal fibres are less severely affected than the other parts of the facial nerve. As regards the frontal, the author differs decidedly from these observers. At Mann's request, Dr. Cohn, assistant in Mendel's clinic, paid special attention to the subject, and found four cases of facial palsy (the number examined not stated) with reaction of degeneration, in which the orbicularis oris was not affected. In three cases the orbicularis palpebrarum was not affected, or was less severely affected than the muscles of the face generally; and in two cases the levator labii superioris. In a fifth case the orbicularis palpebrarum and the levator labii superioris were intact and the orbicularis oris paralyzed. According to Gowers, preservation of the function of the orbicularis oris in facial paralysis indicates a central lesion; but the cases now reported show that the rule is not absolute. In these cases the electric reactions indicated peripheral disease. In two cases the paralysis followed ear-disease, and in another an operation on the mastoid process. Mann mentions paralysis of the radial as an example of peripheral paralysis in which not all the fibres are always affected, the supinator longus escaping not rarely. This may be due to the fact that the branches come from different centres. If this explanation be correct, it can, perhaps, be applied to the cases of facial paralysis in which the orbicularis of the mouth or eye escapes. According to experiments of Mendel, the fibres for the orbiculo-frontal part of the facial arise from the oculomotor nucleus, and Tooth and Turner in a case of disease of the facial nucleus found those fibres intact. Hughlings Jackson found paresis of the orbicularis palpebrarum in a case of disease of the oculomotor nucleus.

These observations require further confirmation before they can be applied to cases like those of Mann and Cohn, since the extent of the oculomotor nucleus is not yet exactly defined, and it is possible the relations are not constant. In conclusion, Mann intimates that in his opinion a peripheral origin may have been present in the cases of congenital facial palsy described by Schultze and others.

THYROID-FEEDING IN GOITRE.

BRUNS (*Beiträge zur klinischen Chirurgie*, xiii.) reports the results of the treatment of sixty cases of goitre with thyroid. Cases of benign parenchymatous goitre were put under treatment without selection. Cystic cases and those of malignant disease were excluded, as were also cases of exophthalmic goitre, in which, as has been shown, thyroid-feeding makes the symptoms worse. Instead of raw thyroid, tabloids were used in the dose of two daily to adults, one to children. By this method of administration intoxication is least likely to occur. Unpleasant symptoms, such as palpitation of the heart, nausea, diarrhœa, tremor, headache, etc., were treated by temporary withdrawal of the remedy. The duration of treatment was from three to four weeks on the average. In young children complete recovery was the rule. In older children marked diminution in the size of the goitre was observed with cessation of symptoms. In adults recovery was rare and less common in proportion to age. Complete return of the thyroid to its normal size is not to be expected later than the twentieth year. In some cases in which tracheotomy seemed necessary thyroid-feeding removed the pressing symptoms, and in cases of partial resection of the gland with hypertrophy of the remaining part the enlargement was reduced by treatment. Mild relapses were seen only three times, and in each case rapidly relieved by renewal of treatment.

URIC ACID AND LEUCOCYTOSIS.

The theory of Horbaczewski, that uric acid is a product of the breaking-down of leucocytes, and that its excretion in the urine goes on parallel with the dissolution of leucocytes, is so convenient that one can easily understand how it has been accepted by many as though well grounded. At the same time, both the chemical theory and the alleged clinical facts on which Horbaczewski based his theory can be criticised. **Richter** has recently investigated the clinical aspect of the matter in Senator's clinic, with results which are unfavorable (*Zeitschrift für klin. Medicin*, Bd. xxvii., H. 3 and 4). The material used was derived from infectious diseases in which leucocytosis usually occurs; in diseases of the blood and cachexias, with increase of leucocytes, and in experimentally produced conditions with either increase or decrease of leucocytes. The uric-acid estimations were made by the Ludwig-Salkowski method. It was soon discovered that one of the conditions which has been asserted as tending to vitiate the results was in reality present, namely, that uric-acid excretion varies so much in health that it is difficult to avoid erroneous conclusions. It was found, for example, that whereas the results in the early part of a particular investigation seemed to bear out Horbaczewski's theory, prolonged observation showed that the excessive excretion was constantly high in that patient, so that the supposed increase during leucocytosis did not exist. In a case of leukæmia the excretion of uric acid was not excessive, though apparently higher than normal, but there was no parallel between excretion and leucocytosis. Injections of spermin caused a fall in the number of leucocytes, and the amount of uric acid also fell in the beginning, although not in the same proportion, but later rose again. Two other attempts gave equally unfavorable results. A case of severe anæmia treated with spermin showed an increase of leucocytes without corresponding increase in the uric acid. Nuclein gave results similar to those obtained by Horbaczewski. A moderate increase of the leucocytes was observed, with marked rise of the uric acid. Richter's conclusion is that Horbaczewski's theory is of very limited application. Two factors are effective at present in preventing us from more accurately studying the question. One is the impossibility of deciding, when a variation in the number of leucocytes occurs, when dissolution of corpuscles begins and how extensive it is; the other is our inability to conclude, from the excreted uric acid, the amount formed in the body.

Experimental Albuminuria.

Seelig has recently examined the mode of production of albuminuria after compression of the thorax (*Archiv für exper. Pathologie und Pharmakologie*, Bd. xxxiv., Heft 1 and 2). He had formerly supposed that albuminuria was due, in the condition mentioned, to lowering of the blood-pressure, which could be demonstrated in the carotids. This view seemed to be supported by the fact that here, as in ligation of the renal artery, the excretion of albumin took place in the glomeruli. The author's investigations, however, reveal an essential difference in the microscopic appearance of the kidneys in the two conditions. After temporary ligation of the artery there is hyperæmia of the cortex, with excretion of coarse albuminous masses stained with blood-coloring matter. After compression of the thorax there is anæmia of the cortex, with fine and colorless albuminous granules. From this result Seelig believes that the disturbances of the kidneys from compression of the thorax are so slight as to be probably within physiological limits. Further experiments showed that sulphindigotate of sodium was excreted as rapidly as normal during the existence of the albuminuria from compression, but that arterial ligature lasting only fifteen minutes caused slow and imperfect excretion of the indigo-salt, lasting for a day. Compression of the thorax is the only method by which experimental albuminuria can be produced without extensive disturbances of the renal circulation.

THE RETENTION OF WATER IN FEVER.

GLAX furnishes a new contribution to this subject, on which he has written before, based on examinations in fifty-three cases of typhoid fever (*Centralblatt für innere Medicin*, 1895, No. 6). Only those patients whose urine could be collected, and who had not profuse diarrhœa, were used for the investigations. The treatment consisted in cool bathing and galvanization of the neck. The quantity of water ingested was noted, as well as the amount of urine passed. As the result of the observations Glax affirms that retention of water occurs in fever, at least in typhoid. The water thus retained in the tissues is excreted in convalescence, causing polyuria. This sometimes occurs suddenly along with the decline of temperature; usually the urine increases gradually, but sometimes diuresis begins during fever, and can be looked on in such cases as a sign of speedy defervescence. Sometimes diuresis is delayed until a late stage of convalescence. In temporary fall of temperature the amount of urine may increase, and *vice versa*. In case of chill followed by fever the urine is increased for a short time. The cause of diminished excretion during fever Glax thinks is low blood-pressure. Corresponding to the theory, diuresis is not diminished in the beginning, is lowest in the second and third week, and rises again with increase in the force of the heart. If the heart is not weakened by the fever, no fall in the amount of urine is observed. If the ingestion of water is increased, excretion is not correspondingly increased until defervescence, and excretion during the febrile stage is better in proportion as ingestion is limited. Glax combats the "washing-out" treatment of Cantani and Sahli in infectious diseases. He also claims that the idea of reducing temperature by drinking large quantities of cold water is wrong in principle, holding that high temperature is more likely to be lowered by lessening the amount of water. In his own cases of typhoid fever, in which the amount of liquid ingested varied from 1000 to 1400 c.cm., the temperature was relatively low. This was in cases treated during several years, so that Glax does not think the low temperature a peculiarity of the epidemic.

ANGINA AND RHEUMATISM.

BUSS gives a very comprehensive exposition of the relations of angina and rheumatism (*Deutsches Archiv für klin. Med.*, Bd. liv., H. 1) in which the literature of the subject is discussed from several aspects and a large number of valuable personal observations utilized. From both sources it is clearly shown that angina and articular rheumatism often coincide. Explanations of this differ, however, largely because the coincidence of time is not absolute; but one disease appears before, with, or after the other. In many cases there is pain in the joints without swelling. Many French authors look on the angina as the expression of a "rheumatic diathesis." Many English authors, on the contrary, look on the angina as the point of entrance of the rheumatic poison, a view more in accord with modern knowledge of infectious diseases. After describing the anatomical peculiarities of the joints and their tendency to become affected in infectious diseases, a number of examples are cited of localization of micro-organisms in the joints. The author then takes up the subject of rheumatism as an infectious disease, and after quoting authorities mentions a number of interesting examples of house-infection in rheumatism. Prinzing found, for example, that most cases of rheumatism occur in the old parts of towns, and that in these certain houses and rooms have a predilection. Edlefsen made similar observations; rheumatism occurred less frequently in basement-rooms and new houses than in older ones. Fiessinger found that in Oyonnax, a town with five hundred houses, half of all the cases of rheumatism in a number of years occurred in ten houses in one small street. Bacteriological examinations of the joints and the exudates in acute articular rheumatism have given variable results, many being negative. This may be due either to the fact that the organisms present in the beginning had disappeared by the time the examinations were made, or, as happened in tubercular joint-disease, that they were not free in the exudate. The fact that the exudate in rheumatism is seldom purulent does not prove that it is not due to the action of bacteria, since many pyogenic organisms, either from lack of virulence or from insufficient number, may be unable to produce suppuration, though able to cause serous effusion, as is seen in the pleura. The author then considers the protecting function of the tonsils, which is briefly but clearly described, and goes on to detail some of the evidence regarding the causes of anginas and their complications. The result of the material examined proves: 1. That during or after angina pain or swelling of the joints, apparently rheumatic, often occurs. 2. In the exudate of the angina and in the synovial membrane and exudate of acute rheumatism similiar pathogenic micro-organisms occur. 3. General infection of the body, with disease of the joints, can take place from disease of the pharynx or tonsils. In view of these facts the relation of angina and rheumatism becomes clearer, and at the same time different from what was formerly supposed. Since we know that angina is an infectious disease we can no longer look on it as the evidence of a "rheumatic diathesis" when it appears with the articular affection; rather must we look on the latter as the result of a general infection in which the micro-organisms have entered by the pharyngeal mucous membrane, and especially by the tonsils.

In conclusion, Buss asserts his belief that acute articular rheumatism is due in most cases to pyogenic bacteria with lessened virulence. Among these Fränkel's pneumococcus and Friedländer's bacillus may be included. Rheumatism is, according to this view, a disease like osteomyelitis, endocarditis, and pneumonia, due not always to one and the same bacterium, but capable of being caused by several distinct organisms. It is highly probable that apparently identical clinical pictures may be produced by different organisms, as in the case of the other diseases mentioned. The pneumococcus rheumatism, however, which can occur with or without pneumonia, seems to be especially prone to purulent exudates. The tendency of recent investigations is to deny the specific nature of rheumatism, and to restore to the joint-complications of acute infectious disease the convenient and familiar term which many authors have tried to abolish.

SURGERY.

UNDER THE CHARGE OF

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CARCINOMA OF THE DESCENDING COLON.

The following interesting case is reported by HERBERT ALLINGHAM (*The Medical Press and Circular*, 1894, No. 21): A man, aged thirty years, had been suffering from complete obstruction of the bowels, with vomiting and abdominal tympanites, for ten days before admission to the hospital. The abdomen was opened, and the intestines were found to be enormously stretched, so much so that the author was afraid to explore the cavity on account of the danger of rupturing them. The cæcum was brought into the wound and incised, when two quarts of fecal matter escaped. It was decided to establish an artificial anus. This was done by securing the cæcum in the abdominal wound. The patient did well after this operation. Sometime later it was decided to perform an exploratory cœliotomy to determine the cause of the obstruction. Accordingly an incision was made in the left linear semilunaris. On examining the descending colon a hard, tight stricture was discovered at about its middle portion. Four inches of the bowel were resected, including the diseased portion, and the ends approximated after the method devised by Mayo Robson. This operation was entirely successful, and three weeks later the artificial anus was closed by freshening the edges, freeing the bowel from the abdominal wall, and uniting each structure separately with sutures. The patient left the hospital apparently cured. The growth was found upon microscopic examination to be a carcinoma. A few months later the symptoms returned, and, after employing various measures without benefit, the abdomen was again opened. The peritoneum was found to be studded with nodules, and there were masses in the walls of the small intestine and in the mesentery. The abdomen was closed, and the patient recovered from the operation, but died in about six weeks later, and ten months after the first operation, from general metastatic deposits.

GLIOMA OF THE CEREBRUM; REMOVAL; RECURRENCE. SECOND OPERATION; RECOVERY.

The following case of tumor of the brain, under the care of DR. H. C. WOOD, and operated upon by DR. J. WILLIAM WHITE, is reported in the *University Medical Magazine*, 1895, vol. vii., No. 4, by Alfred C. Wood: The patient, a man, aged twenty-eight years, first observed occasional twitchings in the left hand in August, 1892. These spasms recurred at irregular intervals, but gradually increased in frequency and severity. Consciousness was preserved during the attacks at first, but later was usually lost. On two occasions the convulsions were general. When the patient first came under observation there was no weakness of the left arm, but a slowly progressing loss of power was soon observed in this member. There have been occasional attacks of vomiting and of pain in the head; the latter, at first but rarely felt, became frequent and severe. Diplopia was complained of, and an examination of the eye-grounds revealed double optic neuritis with retinal hemorrhages and large and tortuous retinal veins. The case was thought to be one of glioma or sarcoma involving the motor area of the right side, affecting principally the arm-centre. January 24, 1894, after the usual preparations for an aseptic operation, Dr. White trephined the skull over the arm-centre of the right side, and found the dura tense and bulging. On incising the dura a tumor was seen beneath, and was removed as completely as possible after enlarging the trephine-opening with the rongeur forceps. The patient did well after the operation, but after a time the scalp over the seat of the former wound was found to be elevated. As this swelling gradually increased in size, its removal was decided upon. Accordingly, in May, Dr. White again raised the flap made at the previous operation, enlarged the opening in the skull, and removed the growth, which was similar in character to the first. Convalescence was uninterrupted. All symptoms disappeared immediately after the first operation, and the patient remains well. Microscopic sections of the tissue removed showed the appearances of a glioma.

The interesting features of this case are:

1. The accurate location of the growth clinically.
2. The precision with which the tumor was exposed by the trephine-opening.
3. The immediate and complete left-sided paralysis, followed by perfect restoration of the normal condition in the face, and the return of a very fair degree of function in the leg, while motion in the arm has failed to improve markedly, showing that the arm-centre has been probably almost entirely removed, while the face- and leg-centres were but slightly encroached upon at the operation, and, although suffering temporarily from the traumatism, have preserved their integrity.
4. The recurrence of the growth, followed by its successful removal, the patient remaining well until the present time, now seven months after the last operation and eleven months after the first.

INTESTINAL OBSTRUCTION CAUSED BY A PRESSURE-BAND.

ROBERT JONES details (*British Medical Journal*, 1894, No. 1743) the case of a girl, aged fourteen years, who suffered from violent abdominal pain and severe vomiting, becoming stercoraceous. The history was that for the four years preceding the patient had had what were called bilious attacks. On account of the urgency of the symptoms it was decided to perform exploratory incision. Upon opening the abdomen the visceral peritoneum was found dotted with lymph. The cæcum and portion of the small intestine were found collapsed. Finally a distended loop of small intestine was found immediately below which was a band half an inch wide; this was divided. It was not deemed wise to make any extended examination to determine the origin of the band. The subsequent course of the case was one of uninterrupted recovery.

SARCOMA GROWING AT THE SEAT OF A RECENT FRACTURE.

GRIFFITHS records (*British Medical Journal*, 1894, No. 1743) the case of a man, aged twenty-one years, who sustained a fracture of the femur at the junction of the middle and lower thirds. This was treated in the usual manner, and at the end of five weeks a plaster-of-Paris bandage was applied. At the end of two weeks this was replaced by a linen bandage; at this time the fracture seemed to have done well in every respect. Three weeks later, ten weeks after the accident, a swelling was observed at the point at which the bone had been broken. The tumor rapidly increased in size, the superficial veins were prominent, and the limb very œdematous. The patient gradually sank, and died about six months later. The tumor was removed, post mortem, and was found to weigh nearly twenty-five pounds. Microscopic examination showed it to be a spindle-celled sarcoma, evidently having originated in the periosteum. There was no evidence that a central sarcoma had existed prior to the fracture.

HYDATIDS OF THE FEMUR IN THE SITE OF AN OLD FRACTURE.

EUSTACE reports the following unusual case (*British Medical Journal*, 1894, No. 1743). A man, aged twenty-five years, received a fracture of the shaft of the right femur at the junction of the upper with the middle third of the bone. The patient got about again at the end of six months. Two months later the femur broke spontaneously at the site of the former fracture, and it was noted that a swelling had occurred at the point of fracture. Four months later the patient was brought to the hospital. At this time he was emaciated and weak. A round fluctuating tumor separated the ends of the bone, the slightest movement of which caused severe pain. The hypodermatic syringe gave negative evidence.

An exploratory incision was made which revealed the presence of hydatid cysts. The whole shaft of the femur was found to be involved. On account of the grave condition of the patient hip-joint amputation could not be considered. Further operative interference was therefore abandoned, and during the next six weeks the patient's condition was improved by careful nursing and feeding. Amputation through the hip-joint was then performed by a modification of Wyeth's method. Instead of encircling the limb with the elastic ligature a piece of elastic tubing was twisted in the form of a figure 8 about each skewer. A modified circular operation was then performed. The hemorrhage was entirely controlled. Before beginning the operation a catheter was introduced into the rectum and three pints of a one per cent. salt solution were slowly introduced. The patient's death, which occurred the next day, the author does not attribute to the operation directly, but to the lateness of its performance.

THE PATHOLOGY OF PARAPLEGIA IN VERTEBRAL CARIES, WITH THE INDICATIONS FOR OPERATION.

WILLIAM THORBURN, in a lecture on the surgery of the spinal cord and its appendages (*British Medical Journal*, 1894, No. 1748), gives the following summary:

Paraplegia may be produced in one or other of the following ways:

1. Mere kyphosis is not usually competent to produce paraplegia.

2. Sudden paraplegia may result in rare instances from fracture of carious vertebræ. The frequency of this occurrence is, according to Kraske, about two per cent. of the total number of paraplegias caused by vertebral caries.

3. Still more infrequent causes are the bursting of an abscess into the spinal canal, hemorrhage into the canal, and displacement of bony sequestra which press upon the cord.

4. The most usual cause of paraplegia is pressure by granulation-tissue.

5. In a few cases true tuberculous periarteritis is found within the cord, generally in association with tuberculous lepto-meningitis.

In regard to the prognosis, the author says: "My own experience is, that nearly all cases will recover if kept fixed in the recumbent position for a sufficiently long time, but the time required may be very prolonged." Cases in which the paraplegia is due to intramedullary tuberculous periarteritis can hardly be expected to get well, and those in which pressure has arisen from fracture of the carious bones are not likely to improve to any great extent. Equally unfavorable are some of the other rare varieties of paraplegia.

The following indications for operation are given:

1. A steady increase in symptoms in spite of favorable conditions and treatment.

2. The presence of symptoms which directly threaten life.

3. The persistence of symptoms in spite of complete rest is the indication which has been most commonly adopted.

4. In posterior caries (caries of the arches) operation is clearly indicated, as here we can readily both treat the paraplegia and remove the whole of the tuberculous tissue.

5. The existence of severe pain if the patient is being exhausted thereby.

6. Children, as a rule, yield better results than do adults.

Contra-indications: The presence of active tuberculous changes in other organs. Macewen holds that we should not operate in the presence of pyrexia. The exception to this would be if the cause of the pyrexia could be removed by operation. General meningitis will probably prove fatal whether an operation be performed or not. Cases of fracture of carious vertebræ are manifestly unsuitable for laminectomy, and most paraplegias of sudden onset will fall into this category.

EXTIRPATION OF THE PAROTID AFTER THE METHOD OF PROF. SCHÜLLER.

MANDOWSKY reports in the *Aerztlichen Praktiker*, 1894, No. 33, a case of tumor of the parotid gland, and describes the method employed by Prof. Schüller in removing these growths. The possibility of removing the parotid entire is still a disputed question, but it is admitted by all that the operation is at least one of the most difficult in surgery. This is due to its intimate association with large and important bloodvessels and nerves, and also to the fact that the gland dips deeply into the retromaxillary fossa. The author condemns the ligation of the common carotid, not only because it is an operation not without danger, but also because it will not control the hemorrhage. The same remarks apply to the preliminary ligation of the external carotid. Much more useful is the method proposed by Van Langenbeck of catching each vessel as it is met, applying a double ligature and cutting between, or by applying prophylactic ligatures and provisional constriction of the vessels in the neighborhood of the tumor. The operation can be made almost bloodless. It is also advised in isolating the tumor not to work from all sides, but from above downward and from before backward. The case described is that of a woman, forty-eight years of age; with a parotid tumor removed in this way, securing the vessels with a double ligature and cutting between. Upon histological examination the tumor was found to be an alveolar carcinoma. The patient was discharged at the end of three weeks, the wound being entirely healed.

THE LIMITS AND VALUE OF URETHROSCOPY.

CASPER concludes an article on the above subject as follows (*Annales des Maladies des Organes Genito-urinaries*, No. 9, 1894):

1. In regard to the utility and value of the urethroscope, the principle of external illumination is far superior to introducing a light into the urethra.
2. The urethroscope is, in many cases, of distinct diagnostic and therapeutic value, and cannot well be dispensed with.
3. Owing to anatomical and physiological reasons and the mechanical conditions which result therefrom, urethroscopy is kept within certain limits, beyond which the interpretation of the urethroscopic images becomes impossible.
4. Posterior urethroscopy for diagnosis and therapy is only justified in a small number of exceptional cases.

VICIOUS CALLUS OF THE UPPER EXTREMITY OF THE HUMERUS, AND ITS OPERATIVE TREATMENT.

LEJARS reports two cases illustrating this condition, and quotes others already recorded (*Revue de Chirurgie*, 1894, No. 8). The first patient was a boy, sixteen years of age, who sustained an injury of the right shoulder on the 12th of May. In June he applied at l'Hôpital Necker, when subcoracoid dislocation of the humerus was diagnosticated, and an unsuccessful effort made at reduction by Kocher's method. Further study showed the case to be one of separation of the upper epiphysis of the humerus. There was a marked loss of function. The second patient was a woman, aged thirty-four years, who sustained a fracture of the surgical neck of the humerus. Owing to a persistent and violent delirium it was impossible to keep the fragments in proper position, and union occurred with a deformity very similar to the preceding case. Both patients were operated upon with satisfactory results.

From a study of reported cases and those personally observed the author has arrived at the following conclusions concerning vicious callus at the upper extremity of the humerus:

1. It is produced by a separation of the superior epiphysis of the humerus or by certain fractures of the surgical neck of the same, causing a specific deformity of the shoulder, simulating in certain points a luxation. The inferior fragment is carried upward and inward; there is a certain flattening, a deviation of the axis of the arm, and a subcoracoid prominence.

2. The primary reduction of the deformity is absolutely necessary if one wants to preserve the function of the member; it is also extremely difficult. The object must be obtained by all means, and it will usually be advisable to cut down on the fragments and perform direct coaptation.

3. In the presence of vicious callus resulting from separation of the superior humeral epiphysis, or of a consolidated fracture in a state of deformity, the only recourse consists in exposing the callus, to separate the fragments to replace them in proper position, if necessary to obtain coaptation, to arrest the end of the diaphyseal fragment. If there is a tendency to displacement they should be united by a bone or periosteal suture.

The Treatment of Fracture of the Radius.

Hennequin summarizes the conclusion of his study of this subject in the *Revue de Chirurgie*, No. 9, 1894, as follows:

1. That it is necessary to reduce the fracture of the lower extremity of the radius.

2. That it is necessary to maintain reduction by means of a suitable apparatus, leaving the fingers entirely free.

3. That the patient must use the hand as soon as possible after union.

4. That massage fulfils but one indication, and must not be employed as the only means of treatment, except in those without displacement. Having no other pretension than the restoration of function after consolidation, its *rôle* becomes more restricted if the fingers are left at entire liberty during the treatment.

Conclusions of Studies of Traumatism by Firearms.

1. A ball which strikes the skull, with or without lesion of the cerebral substance, acts only by the general shock communicated to the nervous elements, and therefore the immediate symptoms are only those of cerebral concussion. The wounds of the cerebral substance by firearms are entirely different from those produced by cutting- or thrusting-weapons; while the last are not accompanied by any bulbar symptoms, the first act directly on the medulla oblongata by the shock communicated to the nervous substance.

2. If the ball strikes the regions which fulfil certain functions localized there—as, for instance, the bulb—the destruction of these parts must enter into account in the genesis of pathological manifestations. The other parts of the brain which have known or unknown functions react also under the injury of their elements. [We can recognize the symptoms if parts are affected, the functions of which we know—as, for instance, the psychomotor centres. The symptoms are still unrecognized for the parts where the functions have not been elucidated.] But the injury to all these struc-

tures is not followed by any immediate phenomena, the effect being obscured in the general picture of the concussion.

3. The concussion caused by firearms presents a much greater intensity than that produced by other forms of trauma. The respiratory centre may be paralyzed at once, as may also the pneumogastric centre, which is exceptional in concussion due to the application of blunt force. It is necessary to distinguish between the intensity of the violence producing the concussion, according as it causes paralysis of the vagus or simple excitation, because the modifications of the cerebral circulation are essentially different in the two cases.

4. The centres of the bulb, which are too much stupefied to resume their functions again, may do so, however, if artificial respiration is resorted to. It is not a general law, but the exception confirms the rule, showing the revival of the centres—vasomotor and pneumogastric—which we know are much less sensitive than the respiratory centres to cerebral traumatism and to the variations of the blood-current. It is only in the most extreme cases that artificial respiration does not revive them.

5. A practical and incontestable deduction results from these observations: the importance of artificial respiration in cases of sudden cerebral concussion that threatens life.

Again:

1. In moderate concussion of the brain accompanied by retardation of the heart a cerebral anæmia is produced by active contraction of the vessel.

2. In intense concussion caused by severe traumatisms, and characterized by acceleration of the pulse, there is, on the contrary, paralysis of the vessels, loss of vascular tone, and consequently arterial hyperæmia.

EXPERIMENTAL RESEARCHES ON CONCUSSION OF THE BRAIN.

From an extended study of this subject by POLIS (*Revue de Chirurgie*, 1894, Nos. 7 and 8) we take the following conclusions: That concussion, whether produced by a single trauma or by repeated blows, is accompanied by the same effects upon the nervous system. If certain differences are observed at the moment of the shock, they are easily interpreted and confirm this general rule. The result of the violence, the clinical condition, is identical in the two cases. It is the expression of the same physiological modification of the nervous centres. The analogy is so visible, even in the minutest detail, that there is nothing to be added to the analysis of the bulbar symptoms. A single point worth mentioning is the acceleration of the heart-action in consequence of a violent concussion in the case of the hare. The nervous centres, under the influence of simple anæmia, suffer the same modifications as under the influences of traumatisms.

PAINFUL PERITONEAL ADHESIONS.

NICAISE (*Revue de Chirurgie*, 1894, No. 8) calls attention to the frequency of painful peritoneal adhesions, particularly in the pelvic region. The pains frequently resemble hepatic and nephritic colic. The amount of pain is very variable, being in some cases slight and very violent in others.

Pelvic adhesions are more apt to give pain than are those situated in the abdomen. The diagnosis is frequently difficult, and must be made by exclusion. There are usually no very marked signs. There are apt to be some constipation, indigestion, and perhaps obstruction. In some cases it may be necessary to perform an exploratory operation.

The treatment consists in massage and the wearing of a flannel bandage; but if the pain is severe, an operation to free the adhesions will be necessary for its relief. Some authors state that the same condition is left after an operation, but this is not accepted by Nicaise, who advises the division of the offending band in every case with pronounced symptoms.

DERMOID CYST OF THE ANTERIOR MEDIASTINUM.

DARDIGNAC reports (*Revue de Chirurgie*, 1894, No. 9) the following case: A soldier, twenty-two years old, applied to the Hôtel-Dieu. On entering the military service a prominence of the right chest was noted. Auscultation was negative. It was observed that marching induced some difficulty in respiration. On rising in the morning there was a period of severe coughing, terminating in efforts at vomiting. Finally he was obliged to give up.

There was nothing in the family or personal history that seemed to bear upon the present condition. The whole right chest was enlarged. After three weeks of expectant treatment an aspirating needle was introduced to the depth of seven centimetres at the most prominent part of the swelling in the mammary line and 800 grammes of yellowish liquid withdrawn. An examination showed that the fluid was not purulent. Improvement followed at once, fever was absent, there was no spitting of blood—in short, no consecutive phenomena were to be noted. A second aspiration, ten days later, gave issue to 500 grammes of a fluid similar to the first. Again immediate and more marked improvement followed, which persisted.

Three years later he applied for treatment again, with a swelling of the right side of the chest, being most prominent in the mammary region. It was rounded and resisting. The symptoms improved somewhat by rest, but the general condition was much the same. An operation was performed for the relief of the condition. After excising six centimetres of the fourth rib an aspirator was introduced into the fluctuating portion, and a thick, turbid, greenish fluid was withdrawn, not containing pus or blood, but mixed with particles resembling grains of rice colored with saffron. It was impossible to tell whether the sac was intrapleural or extrapleural. Its capacity was estimated at 1800 grammes. Irrigation brought out some skin, hair, and sebaceous matter, proving the tumor to be a sebaceous cyst. To remove the cyst would have required an extensive costal resection, and as the sac-wall was adherent on all sides it was decided to attempt to secure the obliteration of the cavity by exciting an inflammation. For this purpose tincture of iodine was employed and iodoform-gauze introduced. The patient had a slow convalescence, attended with some fever. Four months after the operation a small retrocosto-sternal cavity persisted, with a fistula twelve to fourteen centimetres deep, which remained as long as the patient was under observation, although it decreased somewhat in its dimensions. The patient gained in weight and seemed in perfect health. The author has collected twenty three similar cases from literature.

OPHTHALMOLOGY.

UNDER THE CHARGE OF
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THE CEREBRAL VISUAL CENTRES.

Does there exist in the cerebral cortex a visual centre, constant in localization and well circumscribed? Where is it situated? What are its anatomic structure and physiologic functions? These are the questions discussed by DR. S. E. HENSCHEN, of Upsala, in the *Revue Gén d'Ophthalmol.*, 1894, No. 8. He points out that in spite of many researches these questions are not yet answered, and brings to bear upon them his own exhaustive and extremely valuable "Contributions to the Pathology of the Brain," of which the first half of Part III. has recently been issued.

Normal anatomy, he thinks, can never solve the problem, Which of the more or less uniform cerebral cells are endowed with the property of perceiving the impressions of light? The experiments of physiologists upon the lower animals have led to results too diverse to inspire confidence. There is no certainty of exactly similar localization and structure in the lower animals and man; while accurate observations, that are often impossible in patients lacking intelligence, are still more out of the question for brutes. Even the method of degeneration, accurate and valuable as it is, does not indicate the function of the parts involved, but only that they are intimately related. Thus, one of Henschen's cases, blind of leprosy for fifty years, showed complete destruction of the eyeballs and chiasm, and complete atrophy of the optic nerves and tracts, atrophy of the external geniculate bodies, pulvinar anterior corpora quadrigemina, the radiations of Gratiolet, and, besides, atrophy extending not only into the occipital lobe, but also into the parietal and temporal lobes. Certainly some of these atrophied fibres, though they have importance in the complex mechanism of vision, do not conduct the impressions of light to the visual centres. Their destruction alone would produce no blindness of a corresponding portion of the visual field. Only the anatomico-clinical method can guide our researches on the localization of the visual centre and its limits.

Applying this method to the questions under discussion, one must consider both the positive cases of hemianopsia and the negative cases as well. Having collected from medical literature all of these recorded with sufficient accuracy to throw light upon the subject, and having carefully analyzed and grouped them, he has arrived at the view that *the cortical visual centre is limited to the* *calcarine fissure.* Whether it is only the posterior extremity of the fissure or portions in front of this that participate in the formation of the centre, it is now impossible to say. The occipital visual tract is situated in the inferior part of the optic radiations, and forms a fasciculus some millimetres to a centimetre thick. *Hemianopsia is produced only by a lesion of this fasciculus or of the calcarine cortex.* He has been unable to find a single well-observed case opposed to this view, although there are in medical literature some defective or badly described observations that seem to oppose it.

As to the supposed localization of this centre in the parietal lobe, Henschen points out that while numerous cases of lesions of this lobe have been accompanied with hemianopsia, many more cases of such lesions have existed without any such symptom. He gives diagrams of a number of these, in some of which the lesion was small, but in others it was very extensive. An analysis of these cases shows that the lesion of the parietal lobe causes hemianopsia only when it involves the visual fasciculus in the inferior portion of the optic radiations. The same applies to lesions of the precuneus and of the temporal lobe. A great quantity of anatomico-clinical facts locate the visual centre in the occipital lobe.

The exact location of the centre in this lobe must be learned from cases described with great detail. Evidently the effects of a lesion will vary with the depth to which it extends in the white matter. The distinction must, therefore, be made between lesions involving the white matter and those confined to the cortex. Only the latter can indicate the exact localization of the centre in the lobe. It is noted, however, that in cortical lesions the fibres always suffer, so that the subcortical layer shows degeneration. Lesions strictly subcortical have, therefore, the same significance as cortical lesions.

As to the location of the centre on the lateral surface of the lobe, Henschen figures six cases of such lesions, in some cases bilateral, without hemianopsia or blindness. He knows of no published case in which lesions of the lateral surface not involving the optic radiations have caused blindness, except one where the depth of the lesion was not indicated. On the contrary, lesions of the median surface of the lobe produce hemianopsia even when limited to the cortex. Not all such lesions, however, cause it. He figures three cases, one with extensive and multiple lesions in which sight was preserved. In none of these was the cortex lining the calcarine fissure affected. He then figures sixteen cases of lesion of the median surface in which hemianopsia did occur. In some the lesions were limited, in some extensive, but all involved the walls of the calcarine fissure, or the visual fasciculus, the lower part of the optic radiations.

Bearing on the question of the limits of the visual centre, Henschen has recorded one case in which the lesion was limited to the cortex of the calcarine fissure and the hippocampus with hemianopsia. The lesion had been stationary several months, was a softening from thrombus, and the white substance was affected secondarily only to the depth of 1 or 2 millimetres. The patient was intelligent, and the visual field had been repeatedly taken by different observers. The microscopic examination was minute, and the case uncomplicated by lesions of the central ganglia. It is impossible at present to limit the centre more precisely than seems to be done by this case.

A point of peculiarity in the anatomical organization of this region is presented in the molecular layer of the cortex, which is here very thick.

Regarding the physiological organization of this centre, Henschen believes, in opposition to most other writers on the subject, that the centre for colors is coincident with that for light, although color-impressions may be perceived by particular cells or by a special layer. Cases are still lacking to decide fully this point. Henschen is also convinced that both the direct and the crossed fasciculi are represented in the cortex of the calcarine fissure, the cortical elements belonging to them being probably placed the one alongside the other. If the opposite theory of Munk, founded on experiments on the lower animals, were applicable to man, monocular hemianopsia would be certainly very common. Henschen knows of but two imperfectly observed cases, in one of which there was no autopsy, while in the other it was very incomplete.

Henschen proposes to designate as the cortical or cerebral retina this part of the cortex lining the calcarine fissure, to distinguish it from other portions of the cerebral cortex taking part in the act of vision, which might properly be included under the more general term visual centre. He thinks the question as to whether we can determine which part of this area represents the macula lutea and which the peripheral visual field, is to some extent answered by cases reported by Hun (this JOURNAL, January, 1887), by Wilbrand, and by two of his own. In one of the latter the right occipital lobe had been extensively disorganized, including the optic radiations, while the left presented nutritive disturbances and slight softening which rendered useless the cortex of the posterior two and a half centimetres of the calcarine fissure. Yet this patient could read fine print to the last days of her life, showing unimpaired vision at the macula. In another patient with bilateral lesions of the cuneus and destruction of the cortex of the posterior part of the fissure on the right side the central field was also preserved, showing that it did not depend on the cuneus.

The arrangement of the cerebral or cortical retina appears to be, with the macula anteriorly, the peripheral field in the horizontal meridian posteriorly, the upper lip of the fissure corresponding to the upper part of the retina (lower field), and the lower lip of the fissure to the lower part of the retina (upper field). Probably each half of each macula lutea is represented in both occipital lobes, and each quadrant—upper and lower—receives fibres through both the upper and lower parts of the optic radiations.

CAUSES OF FAILURE OF IRIDECTOMY TO RELIEVE GLAUCOMA.

E. NEACHER COLLINS, in his extensive experience as Curator to the Royal London Ophthalmic Hospital, found that by far the commonest cause (*Lancet*, No. 3721) of failure to relieve glaucoma by iridectomy was the non-removal of the iris up to its extreme periphery, so that a portion of it is left blocking up the filtration-area. In glaucoma of long standing the root of the iris becomes absolutely adherent to the cornea, and when drawn upon, instead of tearing at its junction with the ciliary body, tears at the point where it ceases to be adherent, so that the filtration-area never becomes opened up. On this account he urges the necessity of performing iridectomy early in chronic glaucoma. Another cause is adhesion of the lens-capsule to the wound, from slow re-forming of the anterior chamber. This causes the pressing of the stump of the iris, or the ciliary processes, against the ligamentum pectinatum, in the situation of the coloboma for cases of this kind. Scleral puncture has been suggested as a preliminary to iridectomy, and has answered well; but a possible danger of this procedure is suppuration of the vitreous, of which Collins has seen one case. Prolapse or adhesion of the ciliary processes to the sclero-corneal cicatrix not infrequently occurs when the incision has been very peripheral. This blocks the filtration-area even if the iris has been removed up to its extreme periphery. In acute glaucoma he does not think it necessary to make the incision very peripheral, provided an iridectome-dialysis be done. The iris, unless already firmly adherent to the cornea, tears away naturally at its root when drawn upon, wherever the incision is, and a peripheral incision certainly increases the risks of the operation.

CHANGES IN THE CILIARY BODY FROM TAPPING THE ANTERIOR CHAMBER.

RICHARD GREEF (Berlin), by experiments on rabbits, has found (*Archives of Ophthalmology*, vol. xxiv., No. 1) that when the anterior chamber is opened the aqueous humor which escapes does not coagulate on standing, and contains neither fibrin nor albumin, thus differing from blood-serum. If, however, the anterior chamber be soon opened a second time, the fluid that escapes coagulates promptly, is rich in albumin, and contains much fibrin; and some hours later there is usually a deposition of fibrin in the anterior chamber in the form of a delicate membrane which disappears in a short time.

On enucleating and examining microscopically the eyes thus treated Greef found remarkable changes confined to the ciliary processes. Immediately after the puncture large vesicles appear formed by the elevation of the epithelium, and containing coagulated masses, clusters of red corpuscles and occasional white ones. They are more numerous on the anterior portion of the ciliary processes. Ten minutes after the puncture they are to be found in all stages of development—small flat elevations of the epithelium, incipient vesicles, numerous large vesicles, and vesicles collapsed. Twelve hours after puncture small developing vesicles may be found; after three or four days some vesicles are still seen; but after six days no trace of them remains.

ANEURISMAL PROPTOSIS OR VASCULAR PROTRUSION.

In reporting a case of bilateral exophthalmos with hemorrhagic neuro-retinitis, probably from traumatic intracranial arteriovenous aneurism, G. E. DE SCHWEINITZ (*International Medical Magazine*, vol. iv., No. 1) brings together cases, hitherto uncollected, to the number of 37, which, added to those previously collected by Sattler and Nieden, give a total of 181 cases. Of these cases, traumatism is responsible for about 60 per cent. Exophthalmos is usually confined to the side of injury, but was bilateral in 12 cases out of 96.

In the treatment of this condition ligature of the common carotid yields the best results. This operation was performed in 102 cases with 11 deaths, 3 of which it is claimed were not attributable to the operation. The earlier operations were done, however, without the advantages of aseptic surgery. Of the cases collected by de Schweinitz, 21 were operated on, all since 1886, without a single death.

De Schweinitz's case occurred in a man aged forty-one years, injured by an explosion, causing unconsciousness, but no demonstrable fracture of the skull. Three weeks later there was venous hyperæmia of both the external and retinal vessels, which continued. Ten months later there developed a roaring in the head like the puffing of an engine, with an objective bruit, optic neuritis, and retinal hemorrhages.

OPTIC NEURITIS OF GONORRHŒAL ORIGIN.

PANAS (Paris) attributes to this cause (*La Presse Médicale*, February 23, 1895) a case of double optic neuritis occurring in a waiter, aged twenty-six years, who had not suffered from syphilis, rheumatism, or any eruptive fever, but who for several years had suffered with chronic blennorrhagia, with repeated relapses. He suffered violent pain in the lumbar and sacral regions, extending to the pelvis and lower limbs. Micturition was painful, the urine thick and ammoniacal. No interference with motility or general sensation, and no trophic disorders were observed. The cause of pain was localized disease, believed to be gonorrhœal, at the lower extremity of the spinal cord.

With the right eye he counted fingers with difficulty at a metre and a half. The field of vision was concentrically contracted, with a true scotoma in the lower nasal portion. Color-sense was good, pupil and ocular tension normal. The optic papilla was protruding, cloudy, its border indistinct, capillary vessels numerous, veins full and tortuous, arteries small. There was fine dust-like opacity of the vitreous, but not enough to hinder the view of the fundus. The left eye showed no functional impairment, but similar fundus-changes, only less in degree.

A similar case Panas had previously observed in a man, aged twenty-nine years, who had suffered from chronic blennorrhagia, multiple articular and sciatic pains, and a meningitis of the base. He thinks other causes of neuroretinitis can be excluded in these cases, and, on account of the well-known tendency of gonorrhœa to produce visceral and nerve-lesions, feels justified in regarding it as the cause of the optic neuritis.

TREATMENT OF CORNEAL ULCER.

DR. MULES (*Trans. Eighth International Ophthalmological Congress*) claims great efficiency for the following method, even in the presence of extensive corneal infection and hypopyon. The cornea is first anæsthetized with an 8 per cent. cocaine solution, which also renders it hygroscopic, an iodoform-wafer softened by soaking a minute or two in cold boric acid solution is laid over the cornea, the lid drawn from the globe, and the eye gently closed. An iodoform-pad is fixed with strips of plaster, and a flannel roller-bandage firmly applied over the closed lids. The iodoform-wafer is prepared by dissolving gelatin in a saturated solution of boric acid, and stirring in iodoform reduced by trituration to an impalpable powder, then spreading over glass-plates to the required thickness, and allowing to dry.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

J. SOLIS-COHEN, M.D.,

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Osseous Synechia with Cystic Myxoma of the Right Nasal Fossa.

This unique case is reported (*Revue de Laryngol. d'Otol. et de Rhinol.*, 1895, No. 5) by Dr. Bonain, of Brest: A large tumor obstructed the right nasal fossa of a vigorous young man, nineteen years of age, who had suffered from the occlusion since infancy. The septum was very much pushed to the left side, forming, in part, a cavity for the reception of one side of the tumor. The tumor was removed with the electric snare, and immediately gave exit to a liqueurglassful of yellowish-brown mucus very thick and viscid. It had been attached to the middle turbinate bone and to the upper portion of the septum. After its removal a vertical osseous plate was found obstructing the fossa transversely, and giving passage to air under its inner and inferior border. This was removed piecemeal with a gouge, and found to be more than one half millimetre in thickness, and to be covered on both faces with a pale and very fine mucous membrane. The patient recovered promptly, with entire cure of the severe headaches, conjunctivitis, and epiphora, which had been the result of the presence of the morbid structures.

Empyema of the Frontal Sinus.

While Zuckerkandl states that he has never seen an instance of isolated inflammation of the lining membrane of the frontal sinus, or any instance of dilatation of the sinus due to empyema, Dr. Leopold Müller, who makes the citation above, states (*Wiener klin. Woch.*, 1895, No. 11) that in his cases of inflammation of the mucous membrane of the sinus which proceeded to empyema, subsequently to dilatation, and in some instances to perforation of the walls of the sinuses, all of them, ten in number, presented themselves clinically as isolated inflammations of this pneumatic cavity. They are principally encountered in eye-clinics.

Dr. Müller narrates in detail a case of acute suppuration due to influenza, in which extensive metastases took place in two directions, necessitating serious operative procedures to evacuate the pus, and which ended fatally about the fiftieth day of the disease.

Excision of the Larynx.

Dr. Charles A. Powers, of Denver, Col., and Dr. George R. White, of New York, report (*Medical Record*, 1895, No. 1272) 6 cases of excision of the larynx; 1 case performed by Dr. Powers, and 5 cases performed by Dr. W. T. Bull, of New York; and they present an analysis of 300 additional cases gathered from literature, 309 in all. This makes it one of the most valuable contributions to statistics on the subject that has appeared for some time.

Of the 6 new cases, Case 1 was partial laryngectomy for cancer, with death from recurrence at the end of five months; Case 2, total laryngectomy for cancer, with death at the end of one year; Case 3, partial laryngectomy for cancer, with death in fourteen months; Case 4, partial laryngectomy for sarcoma, remaining well at the end of four years; Case 5, total laryngectomy for cancer, with death occurring at the end of two and one-half months; Case 6, partial laryngectomy for cancer, with death from the operation.

Of 208 cases of total extirpation, 185 were for carcinoma, 11 sarcoma, 4 tuberculosis, and 8 varied. Of these, 73 died as the result of the operation, 51 more died within six months, and 24 died between six months and one year, 10 between one and two years, 8 between two and three years, 15 survived three years or more, while 27 were not traced or were reported too early.

There were 101 cases of partial excision of the larynx, 82 for carcinoma, 4 sarcoma, 3 tuberculosis, 12 for other causes. Of these, 28 died as the result of the operation, 22 more died within six months, 8 between six months and a year, 6 between one and two years, 3 between two and three years, while 8 survived three years or longer, and 27 remain untraced or reported too early.

The results of the tables are summed up as follows:

Total laryngectomy for cancer: of 180 cases, in 72, or 40 per cent., death occurred as the direct result of the operation itself. Of the remaining 108 cases, 51, or nearly one-half, had recurrence during the first year; and 11, or a little more than 10 per cent., of the survivors were free from relapse three or more years after the operation.

Partial laryngectomy for cancer: 77 cases, of which 26, or more than 33 per cent., died during the first two months. Of the remaining 51, 7 cases, or 13 per cent., are reported free from recurrence three or more years after the operation.

In discussing the results of their study, the authors call attention to the circumstance that in both the total and the partial operation but two cases relapsed after the three-year limit had been passed—one in three years and four months, and the other at the end of nine years.

They likewise intimate that there may be unrecorded fatal cases, while it is unlikely that there are any unrecorded cured cases.

Cases reported as free before the lapse of three years are deemed of very little value, except that they diminish by so much the operative death-rate.

They deem it obviously improper to include in the same category a case in which the cancer had progressed to the tissues outside the larynx, and one in which there was a small intralaryngeal epithelioma. In the one case there is no chance for cure, in the other a wide excision may offer a fair prospect from relapse.

TUBERCULOSIS OF THE LARYNX.

DR. WALTER F. CHAPPEL reports (*New York Medical Journal*, 1895, No. 852) a number of cases of tuberculous laryngitis very much benefited by the submucous injection of minute quantities of creosote in addition to its topical and constitutional use. The method is fully described, and an illustration is given of an ingenious automatic syringe by means of which the amount of solution injected can be limited to one drop when necessary.

Foreign Bodies in the Maxillary Sinus.

I. In an article upon this subject (*Archives Internat. de Laryngol. de Rhinol. et d'Otol.*, 1895, No. 1) Dr. M. Gouly reports a case in which, while washing out the sinus after an operation, the patient made an abrupt movement by which the end of the canula broke off and remained in the sinus. Eight days afterward the foreign body was expelled from the nasal fossa while the canal was being washed out. Rhinoscopic examination showed considerable hypertrophy of the mucous membrane of the middle meatus. The end of the canula, which was conical in form, measured fifteen millimetres in length and six millimetres in breadth at its base, almost the extreme limits of the size of the largest semilunar hiatus.

Dr. Gouly refers to a case of Eulenstein's, in which the point of a trocar had remained several months in the sinus, and was evacuated by the nasal fossa during a washing; a case of Koenig's, in which a knife-blade four centimetres in length escaped subsequently from the nose, after having sojourned forty-eight years (?) in the sinus; a case of A. Combe's, in which a drainage-tube was eliminated spontaneously from the nasal fossa after a sojourn of four years and one month; and a case of Moure's, in which twelve fragments of cotton had been pushed into the sinus by a dentist after the extraction of the first molar. Three of these fragments were extracted subsequently by forceps, and the last one was expelled from the nose during the use of the handkerchief.

As a result of these and other cases reported, the writer recommends abstinence from all active intervention other than repeated ablutions of the sinus, unless some deleterious consequences point to more energetic treatment.

II. In an article on the same subject (*Revue de Laryngol. d'Otol. et de Rhinol.*, 1895, No. 5) Dr. J. Baratoux, of Paris, presents a summary of the literature on this theme, and follows with a record of two interesting cases of his own, both the result of bad dentistry. The first one was the wife of the dentist himself, who, during a period of eighteen months or more, had inserted pledgets of cotton in a fistulous tract at the level of the second molar in order to treat, as he supposed, the shell of tooth remaining in the alveolus. Dr. Baratoux had the alveolus opened, when a mass of cotton the volume of a small orange was removed from the sinus.

It appears that the dentist had taken it for granted that his wife had either swallowed the tampons or lost them, and was ignorant of the fact that the fistula communicated with the maxillary sinus.

The second case was a still more unfortunate one. A lady's antrum had been opened by the sacrifice of a healthy first molar, although the second molar was gone, and a laminaria-tent had been inserted into the orifice to keep it open. The next day a silver tube was introduced into this opening, but no trace could be found of the laminaria-tent, which the patient was accused of having lost, although she denied it positively.

During a period of six years this poor woman was subjected to various operations through the cheek for the relief of a suppuration of the sinus which was not supposed to be due to the presence of a foreign body. She finally was transferred to the care of Dr. Baratoux, who extracted, through the fistula of the cheek, half of the laminaria-tent, three and one-half centimetres in length and four millimetres in diameter; and three weeks later he extracted the other half, after which the patient got well.

HEMORRHAGIC PHARYNGITIS.

Under this head **DR. NATIER** narrates (*Rev. Internat. de Rhinologie*, etc., 1894, No. 15) a case of effusions of blood from the pharynx of a shopman, twenty-nine years of age, one or twice to the amount of a tumblerful—once, indeed, under the eye of the narrator, to the amount of a liqueurglassful. No lesion existed, the hemorrhage being purely diapedic. It was finally controlled by an application of silver nitrate solution, 1:8, followed by applications of citron-juice made by the patient on occasion of recurrence for a few days.

TROPHIC ULCERATIONS OF NOSE AND EARS IN A CASE OF BULBAR TABES.

DR. C. GIRANDEAU publishes (*La Presse Médicale*, October 27, 1894) this interesting and unique case: A postman, thirty-eight years of age, had been for six years a subject of tabes, which had begun with strabismus and other ocular disorders, followed two years later by vertigo, genito-urinnary disorders, and intense gastric crises often excitable by odors, such as tobacco-smoke. During the last eight months indolent ulcerations and erosions had occurred about the orifices of the nose and ears and upon the surfaces of frontal cicatrices of apparently syphilitic origin. Under the internal use of silver nitrate and topical applications of boric acid much amelioration had been produced, and had become much more pronounced under subcutaneous injections of testicular liquid on the method of Brown-Séquard, the ulceration having become completely controlled in some places, while it remained stationary in others.

PHARYNGEAL SPASM IN TABES.

MR. COURMONT has observed (*Revue de Méd.*, September, 1894, *idem.*) a case of veritable tonic spasm of the pharynx absolutely analogous to laryngeal crises. The symptoms were so intense that alimentation became impossible and death appeared imminent. There was no laryngeal, œsophageal, or gastric phenomena. The manifestations ceased abruptly under the influence of suspension. Hence it was inferred that the spasms must have been due to peripheric lesion.

CYST OF THE LARYNX CURED BY INJECTIONS OF CARBOLIC ACID.

In the *New York Medical Journal*, 1894, No. 882, **PROF. INGALS**, of Chicago, reports a large cyst of the ventricular band, and probably of some two years' duration, in a man forty-three years of age. Injections of lactic acid failing to reduce the growth permanently, solutions of carbolic acid, 8 to 10 per cent., in glycerin and water, were injected once a week or so for five or six weeks, with such approximity to disappearance of the cyst that the injections were suspended to note whether there would be any refilling. Three months later the cyst had become obliterated, and the cure appears to have been permanent. A very good woodcut illustrates the article, but it requires the use of a mirror to exhibit a proper image of the larynx to the reader.

ACUTE INFECTIOUS FOLLICULAR GLOSSITIS.

Every now and then an acute inflammation of the lymphoid nodules of the base of the tongue is encountered, described by **MASSEI**, in 1884, as a new form of glossitis. Much more frequently a chronic inflammation is encountered, usually in association with lacunar tonsillitis, the white exudations at the mouths of the ducts in the base of the tongue being very marked.

DR. VINC. GARZIA, of Naples, has recently studied the acute variety of the disease bacteriologically (*Rev. Internat. de Rhinologie*, etc., 1894, No. 17), and has found that the closed follicles reveal only the diplococci of Fraenkel, while follicles which have undergone ulceration reveal the yellow staphylococci also.

EPISTAXIS.

In a paper (*Rev. Internat. de Rhinologie*, etc., 1894, No. 15) based upon 250 cases of epistaxis, **DR. EGMONT BAUMGARTEN**, of Budapest, presents some points of interest. While 150 cases occurred in males and but 100 in females, the proportion between the ages of thirty and fifty years was far the greater in females, a circumstance attributed to supplementation of the menstrual flux. No cases were observed in patients less than one year of age. The seat of lesion was over the cartilaginous septum in 219 cases, the membranous septum in 2, the osseous septum in 4, the floor of the nose in 5, the inferior turbinate in 8, the middle turbinate in 5, and at various other localities in the remaining 7 cases. Fifteen of these cases occurred during an epidemic of influenza, 8 in association with anæmia, and 1 with purpura.

Baumgarten prefers chromic acid as a cauterant to the electric cautery, because of the impossibility at times of removing even the incandescent instrument without detaching the eschar, and thus renewing the hemorrhage should such detachment take place; the second cauterization is made with the acid. Hemorrhage is restrained with tampons of iodoform gauze. While most cases yield rapidly, some cases require protracted treatment, especially in the subjects of arterio-sclerosis and leucæmia, one case of the latter being mentioned which occupied some two years in controlling the ever-spreading zones of hemorrhage.

[Some cases of epistaxis are due to hemorrhage from diseased lymphoid glands at the vault of the pharynx escaping through the nose. This fact seems to be ignored or unknown by most writers on epistaxis.—J. S.-C.]

INTRANASAL OPERATIONS IN TUBERCULOUS SUBJECTS.

DR. KARL HESS, of the Sanatorium for Consumptives in Falkenstein, contributes an article on the employment of electrolysis in thickenings and deflections of the septum narium (*Münchener med. Wochenschr.*, 1894, No. 39).

The chief interest of this paper lies in the fact that it is based upon the procedures practised upon the inmates of the institution only—that is, upon consumptives. Another interesting point is in the fact that as these patients were inmates of the institution for months consecutively, the cases could be well watched and cared for. Bloody operations were found to produce slight rises in temperature. Frequent burnings in the nose often produced very uncomfortable results, such as loss of appetite and insomnia. For these reasons Dr. Hess determined to resort to electrolysis. The reactions were much more insignificant than after similar procedures in private practice, a result attributed to the pure air and the absence of deleterious chemic and bacteric admixtures in the atmosphere.

Rhinopharyngeal Syphilitic Lesions.

In the *Münchener med. Wochenschr.*, 1894, No. 39, **Dr. M. Kahn**, of Würzburg, calls attention to two cases of otalgic symptoms, due to specific ulceration of the rhinopharynx extending to the pharyngeal outlets of the Eustachian tube, and which he describes in detail. These are examples of isolated rhinopharyngeal syphilis, differing from all other recorded cases (several citations from which are given) in the presence of otalgia, which is not noted in the reports of other observers.

OBSTETRICS.

UNDER THE CHARGE OF

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Bacteriological Study of the Genital Canal during Pregnancy.

The much-discussed question as to the presence or absence of pathogenic micro-organisms in the genital canal during pregnancy has received recent study by **Walthard** in the Obstetrical Clinic of Bern (*Archiv für Gynäkologie*, Band xlviii. Heft 2). He found that the mucus ordinarily found in the vagina does not necessarily hinder the growth of pathogenic germs, but that the secretion of the cervical canal is not a favorable medium for their growth and development, and undoubtedly prevents the growth of bacteria within the uterus. In fact, the cervical canal is the border between those portions of the genital tract which are free from bacteria and those which contain them. The mucus found in the vagina and leucocytes act as antiseptics rather than as aseptic substances. It is possible by digital examination to transfer to the cervical canal bacteria from the vagina. The rupture of the membranes and escape of amniotic liquid do not absolutely remove the bacteria from the vagina. Micro-organisms which, under normal circumstances, may be isolated from the cavity of the uterus during the puerperal period, found their way into that portion of the body during labor. An examination of the mucus found in the vagina revealed the presence of streptococci, with, however, a much less degree of virulence than the same germs derived from tissues in phlegmonous inflammation, or from the lochia in puerperal septicæmia. At the beginning of labor these vaginal streptococci are without virulence, and when brought in contact with the amniotic liquid do not become virulent. Aseptic lochia increase their activity but little. Any cause, however, which diminishes the resisting-power of the tissues may permit the entrance of these germs into the connective tissue and set up a process of fatal septicæmia.

The virulence of streptococci found in the vagina is that of the same germs found upon healthy mucous membrane in other portions of the body, as in the intestinal tract. They are, in fact, not virulent, but are saprophytic germs upon healthy tissue. They can, however, take upon themselves a parasitic character when the resistance of the tissues is diminished. Under certain circumstances they may become the infective germs of puerperal fever. In addition to vaginal streptococci, puerperal sepsis may be caused by staphylococci, gonococci, and the bacterium coli commune; the latter germ may be found in vaginal mucus and in amniotic liquid. They may turn the lochial discharge brownish and offensive, although this condition of the lochia does not point to the presence of streptococci.

From these researches the following practical conclusions may be drawn regarding the prophylaxis of puerperal sepsis: whenever it is necessary in an examination for operative procedure to introduce the finger or an instrument within the cervix, the vagina should first be thoroughly antisepticised; in all cases of normal labor this procedure should be carried out; in all patients the resisting-power of the tissues is lessened by any cause, such as nephritis, valvular heart-disease without compensation, syphilis, diabetes, intercurrent infections, and anæmia. In view of the antiseptic powers of leucocytes normally found in the vagina, any antiseptic employed for this purpose must be such as not to destroy the power of these cells. Such solutions must not be too strongly concentrated, for such destroy the integrity of the mucous membrane, thus destroying the leucocytes and furnishing a good culture-medium for poisonous germs.

TRAUMATIC RUPTURE OF THE UTERUS DURING PREGNANCY.

An interesting case of this accident is reported from the clinic in Würzburg, by REUSING (*Centralblatt für Gynäkologie*, 1895, No. 2). The patient, a woman, aged twenty-three years, in the eighth month of her first pregnancy, fell from the roof of a shed or stable, between twelve and fifteen feet high, upon hard earth beneath; she struck upon both feet, and sank down upon her knees. She made about twenty steps afterward, and then had to be carried into the house. As no external symptoms of injury developed to account for her condition, she was examined under an anæsthetic, the abdomen being tense and very sensitive. There was no hemorrhage, but by palpation the fœtus could be outlined lying partially in the abdomen. Heart-sounds had ceased. The patient was taken to the clinic and cœliotomy performed. The child was lying in the abdominal cavity, in the first stage of maceration, the operation being done three days after the accident. A long rent in the anterior surface of the fundus was found in which the placenta presented. The placenta and membranes were removed, the edges of the rent thoroughly cleaned and freshened, and the tear closed with nine deep silk sutures. The peritoneum was brought together over the tear by continuous catgut suture. The abdomen was sponged as carefully as possible, and closed without drainage. The patient made a good recovery, the lochial discharge remaining normal and escaping freely. It is surprising in this case that the uterus ruptured through so thick a portion, the muscle of the uterus measuring, at the site of the tear, from one and one-half to two cms. in thickness.

Reusing quotes three additional cases, in one of which a young woman, eight months pregnant, fell backward from the top of a hay-wagon, striking upon her back and shoulder, and rupturing the uterus completely. In another case, a pregnant woman, in endeavoring to escape from a horse-car, fell upon her left side, and was slightly injured by the front of the car. In the third case, a young woman, pregnant for the first time, jumped from the third story of a building upon a stone pavement with suicidal intent. She fell upon the right side of the pelvis, upon the elbow and knee. Complete rupture of the uterus occurred, the child and placenta being found in the abdominal cavity.

GYNECOLOGY.

UNDER THE CHARGE OF

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CONDITIONS SIMULATING PELVIC DISEASE.

Rabagliati calls attention to the fact that myalgia of the abdominal and glutei muscles may be mistaken for pain referable to disease of the pelvic organs. Patients with the former condition complain of aching, rather than sharp, smarting pains, while the sensitiveness felt on palpation is distinctly different from that elicited by pressure over diseased adnexa. Minor degrees of tubal and ovarian trouble may coexist with the myalgia, but give rise to no symptoms when the latter is relieved. In favor of the rheumatic origin of the muscular pains are the facts that they are frequently noted in women who have had acute or chronic rheumatism, that the latter affection often develops subsequently, the joint being affected in both, as well as the occurrence of cardiac complications. The writer gives to this form of myalgia in women the name "perimysitis rheumatica." Errors in diet, especially the inordinate use of bread and tea, are stated to be the main causes of the affection, which is best treated by liberal diet and anti-rheumatic remedies. Bathing is an important factor in the treatment, while auto-movements of the affected muscles, while simultaneous pressure is exerted upon them, is preferable to massage.

NERVOUS IMPULSES CONTROLLING MENSTRUATION AND UTERINE HEMORRHAGE.

COLLINS (*British Medical Journal*, January 12, 1895) concludes a paper on this subject with the following practical deductions: There is a nervous centre in the lumbar cord controlling the uterus. Uterine hemorrhage is due either to local conditions within the organ itself, or to extra-uterine influences directly affecting the nervous centre. Menstruation results from the stimulation of this centre by "the decaying decidual cells." Removal of the adnexa causes arrest of menstruation by cutting off the uterine impulses to the centre. The practical deduction is first to explore the uterine cavity in all cases of hemorrhage, to decide whether the cause is local or not.

SERO-FIBROUS APPROXIMATION OF ABDOMINAL WOUNDS.

GREIG SMITH (*British Medical Journal*, January 5, 1895) argues in favor of sero-fibrous as opposed to the ordinary approximation of peritoneum to peritoneum. He claims that union takes place just as rapidly, and is firmer at the end of two days. Moreover, there is less risk of intestinal adhesions than is the case when peritoneal flaps are united with the raw edges turned inward, which is responsible for nearly two per cent. of the deaths after abdominal section.

PRIMARY GENITAL TUBERCULOSIS.

SIPPEL (*Deutsche med. Wochenschrift*, 1894, No. 52) reaches the following conclusions through his studies on this subject: Primary genital tuberculosis results from direct external infection through the vagina, the tubes being more susceptible than the uterus so long as menstruation persists. The diagnosis is made not only by direct palpation of the diseased tubes, but by the detection of tubercle bacilli in bits of the endometrium removed by curettage, and is confirmed by the subsequent development of tuberculous peritonitis. Since it is important to preserve the function of menstruation, the whole or a portion of the ovaries should be spared when the diseased tubes are extirpated. Direct infection of the peritoneum may take place from the latter.

FIBROMA OF THE OVARY.

GRAEFE (*Centralblatt für Gynäkologie*, No. 1, 1895) reports two cases of true fibroma of the ovary, and affirms that he has been able to collect only thirty-six cases in the literature of the last twelve years, which he explains by the active *rôle* played by the epithelium of the ovary as compared with the stroma. One of his patients was fifty-four years of age, the other seventy-two, which was unusual, as these neoplasms are usually found in young subjects. He notes the frequent occurrence of ascites, the cause of which has never been satisfactorily explained. It is possibly due to the irritation of the peritoneum by the hard, movable tumor, since a similar condition has been observed accompanying hard subperitoneal uterine fibroids. The relatively late appearance of the ascites may be explained by the fact that ovarian fibromata form slowly and do not rise out of the pelvis until they have existed for a long time. In both cases the tumor gave rise to severe local and general symptoms due to pressure.

CURETTAGE OF THE UTERINE CAVITY.

WINCKEL (*Münchener med. Wochenschrift*, 1894, No. 13), after reviewing all the various methods of treating endometritis, expresses his preference for the one which he has practised for twenty-five years, which consists in thorough curettage with a sharp spoon, after previous thorough dilatation, followed by swabbing out of the uterine cavity with dry cotton, and subsequent application of the liquor ferri sesquichlor. He never irrigates or uses the gauze tampon. The patient is kept in bed from three to five days, receiving no douches unless vaginitis develops. The operation is not repeated unless there is a recurrence of profuse hemorrhage. Cases of chronic purulent endometritis are usually treated for several months before curettage is again performed.

EXPERIMENTAL STUDY OF THE TREATMENT OF THE STUMP AFTER HYSTERO-MYOMECTOMY.

WALTHARD (*Ibid.*), from experiments on rabbits, arrives at the conclusion that when the stump is transfixed, ligated, and dropped back into the cavity, the fact that its circulation is cut off by previous ligation of both uterine and ovarian arteries does not increase the danger of sepsis, provided that it has not been infected during the operation. This corresponds with the practical results obtained by Zweifel, Kocher, and Leopold, who adopted this method of treating the stump.

EXTIRPATION OF THE VAGINA.

OLSHAUSEN (*Centralblatt für Gynäkologie*, 1895, No. 1) reports three cases of excision of the vagina for carcinoma of the posterior wall, his method being as follows: The perineal body is divided transversely, and the vagina is separated from the rectum by blunt dissection as high as Douglas's pouch. If it is necessary to remove the uterus, the cul-de-sac is opened, the organ is retroverted and the broad ligaments tied off. The uterus with the affected portion of the vagina is then removed with scissors. When the uterus is to be left the peritoneal cavity is not opened, but the affected portion of the vagina is separated from its attachments laterally, as well as posteriorly, and excised, the edge of the vaginal wound being attached in such a way as to establish a close connection between the lumen of that canal and the cavity in front of the rectum. If the vagina is narrow, more room is gained by splitting the posterior wall from the frænum as high as the diseased area.

The prognosis is unfavorable, as recurrence is usually rapid. Out of sixteen cases operated upon in Olshausen's clinic the disease reappeared in fifteen, only one patient being well at the end of two years. This tendency is probably due to the intimate relation between the vaginal wall and the pelvic connective tissue, as well as to the difficulty of preventing cancereous infection of the extensive raw surfaces left after excision of the neoplasm.

MALIGNANT ADENOMA.

RUGE (*Ibid.*) affirms that this variety of neoplasm is distinguished both by the form of the epithelial cells and by their arrangement. As contrasted with the epithelial hyperplasia and new formation of glands seen in ordinary glandular endometritis the malignant growth shows either an overgrowth of cells into the dilated lumen, giving rise to a confused intermingling of cell-columns or a new formation of glands by outgrowths of the epithelial elements, thus presenting the ordinary picture of adenoma.

HYPERTROPHY OF THE SPLEEN CURED BY EXPLORATIVE CŒLIOTOMY.

MARCHAND (*Gaz. des Hôpitaux; Centralblatt für Gyn.*, 1894, No. 21) reports the case of a woman, aged thirty-eight years, who had suffered for eighteen months with marked ascites and œdema of the lower extremities associated with cachexia. She had been tapped several times, each time three gallons of fluid being removed, after which an enlarged spleen could be palpated, extending below the umbilicus. The pulse and temperature were continuously elevated. An explorative incision was made, extensive omental and intestinal adhesions being separated, and the peritoneal cavity was flushed with a solution of boric acid and closed without drainage. The patient recovered quickly, the ascites did not return, the œdema disappeared, and the splenic tumor gradually diminished in size. The writer infers that this result was due to the separation of adhesions and thorough irrigation, which removed the irritation of the peritoneum; how far the hypertrophy of the spleen contributed to the ascites was not clear.

[While the writer is doubtless correct in his conclusions regarding the beneficial effect of the operation, he is in error in calling it an explorative one in the strict sense. We have always held that an explorative cœliotomy is one in which the abdominal cavity is simply opened without disturbing the existing condition, by separating adhesions or irrigation. The curative effects of many so-called explorations are really due to these additional manipulations.—H. C. C.]

TUBERCULOSIS OF THE PORTIO VAGINALIS.

WILLIAMS (*Medical Press*, September 5, 1894) reports two cases of this disease, in one of which the autopsy showed pulmonary tuberculosis with caseous mesenteric glands. The pelvic organs were not affected, with the exception of the lower third of the cervix and the upper part of the anterior vaginal wall, where there was a large ulcerated surface with slightly elevated margin, the base of which was studded with grayish granulations, in which were found typical giant cells and tubercle bacilli. A careful microscopical examination of the uterine body, adnexa, and bladder showed that these were not affected.

In the second case, a multipara, aged thirty-six years, of delicate health but with no tuberculous history, had had a profuse leucorrhœa for several months, with painful and scanty menstruation, but without other local symptoms. There were evidences of incipient pulmonary trouble. The cervix uteri was lacerated and indurated, and on inspection presented an eroded appearance, being the seat of a grayish ulceration, with hard, well-defined edges, which bled freely on swabbing it. Microscopical examination of a portion of the ulcerated tissue showed the characteristic appearances of tuberculosis, bacilli being found in this as well as in the vaginal discharge. The patient improved greatly under general and local treatment, the latter consisting in curettage and the application of pure carbolic acid.

Reviewing the literature of the subject, the writer infers that tubercle of the cervix, whether primary or secondary, tends, in obedience to some unascertained law, to limit itself to that structure, thereby constituting in the first instance the only tubercular lesion in the whole genital tract. It is doubtless due to direct infection by the fingers, by instruments, or by coitus, rather than to the contact of infectious discharges originating higher up in the genital canal, there being a previous lesion of the cervix as well as an "inherited predisposition to genital tuberculosis." Patients between the ages of twenty and forty seem to be most susceptible to this local manifestation of the disease.

It is highly important to distinguish a tuberculous from a cancerous ulceration of the cervix, since hemorrhage and a foul discharge may be present in both. The detection of tubercle bacilli in the vaginal discharge is the only positive evidence of the true condition.

As regards treatment, iodine and iodoform have been used successfully to cause healing of the tuberculous ulcers. Curettage, followed by the use of the thermo-cautery, and complete excision and amputation of the cervix have been employed with more or less success, though the disease tends to recur. [The writer makes no reference to total extirpation of the uterus, which would commend itself to modern surgeons as the most radical way of dealing with a localized manifestation of a disease which tends to disseminate itself so rapidly.—H. C. C.]

COMPARATIVE MICROSCOPICAL STUDIES OF THE OVARY.

FOERSTER (*Ibid.*) concludes a paper on this subject with the following deductions: In accordance with the views of His the ovary is to be looked upon as an erectile organ, with an excess of fibrous over smooth muscular tissue in both the cortex and the medullary portion. In the former the muscular fibres interlace in an almost vertical sagittal direction. A plexiform arrangement of the same fibres is seen in the ovary of the cat, ewe, and the guinea-pig. The arteries of the medulla in the human ovary are very tortuous, their muscular coat being prone to undergo hyaline degeneration, while obliterating endarteritis is common; in the cow, ewe, and sow coils of arteries, veins, and capillaries are always found, the walls of which have undergone myxomatous degeneration, while within these vascular tufts there is an effusion of lymph which (in the opinion of the writer) is probably occasioned by the rupture of lymphatics due to the method of slaughtering. The blood-vessels are often obliterated in consequence of the myxomatous change.

KRAUROSIS VULVÆ.

REED (*New York Medical Journal*, September 29, 1894) reports six cases of progressive cutaneous atrophy of the vulva, four of which were treated surgically. His conclusions are as follows: Kraurosis vulvæ is a distinct disease, of rare occurrence, and of an inflammatory nature. It differs from other inflammations of the skin in that the stage of congestion and infiltration is followed by progressive atrophy. It is confined to the vulva, its etiology being very obscure, and is probably of trophic origin; syphilis is not a causal factor. Excision of the affected area is followed by satisfactory results.

PYÆMIA DUE TO PYOSALPINX.

DÜRCK (*Münchener med. Wochenschrift*, 1894, No. 37) gives a detailed description of the results of an autopsy performed upon a girl, nineteen years of age, who died of pyæmia. She entered the hospital complaining of pain in the right shoulder, her history being otherwise negative. The diagnosis of rheumatism was at first made, but as the temperature remained high, and there was considerable general disturbance, the presence of pus in the joint was suspected, though no fluctuation could be obtained. As the latter opinion was confirmed by puncture, an incision was made, and a quantity of thick pus was evacuated. In spite of the operation the patient grew rapidly worse, and died four days later. At the autopsy the following lesions were found: Purulent periostitis of the right scapula; ulcerative endocarditis; purulent pericarditis and pleuritis; parenchymatous nephritis with purulent emboli; cloudy swelling of the liver. Examination of the pelvic organs showed that the left tube was greatly enlarged and adherent in Douglas's pouch, and contained a quantity of thin greenish-yellow fluid, which was filled with *staphylococci pyogenes aurei*. No local or general peritonitis. Culture-experiments and injections in rabbits fully confirmed the results of the microscopical examinations. Pus from the various embolic abscesses contained similar micro-organisms. The writer infers that the case must be either regarded as one of pyæmia of unknown (*cryptogenetischer*) origin, or else it must be assumed that the pyosalpinx was the original seat of infection, the bacteria entering the general circulation, perhaps in consequence of some slight local injury. That the general invasion was a sudden one was shown by the acute symptoms. While cases of localized and general peritonitis due to the rupture of a pyosalpinx, or to the direct migration of septic bacteria through the wall of the tube to the peritoneum, are sufficiently common, pyæmia originating as in the case cited has not been described in works on gynecology. The gonorrhœal origin of the pyosalpinx, though the history was negative, was proved by an examination of pus removed from the urethra after death.

CHLOROFORM VERSUS ETHER.

This is a question which has agitated German surgeons and gynecologists considerably of late.

MIKULICZ (*Berliner klin. Wochenschrift*, 1894, No. 46) reports several accidents following ether-anæsthesia, which have caused him to abandon it in favor of chloroform. He reports three cases of asphyxia, four of acute bronchitis, two of pulmonary œdema and pneumonia, and two of collapse. He believes that the relative safety of ether has been exaggerated, since too little stress has been laid upon its bad after-effects. In using chloroform, which he regards as especially useful in gynecology, he calls attention to the fact that it is not well borne by septic patients.

SCHÖNHERR (Inaugural Dissertation: abstract in *Centralblatt für Gynäkologie*, 1895, No. 1), from a study of a large number of cases in Sänger's clinic, pronounces in favor of ether, especially in all prolonged operations.

KREEKE (*Münchener med. Wochenschrift*, 1894, Nos. 39 to 41) prefers bromide of ethyl for short operations and ether for longer ones, rejecting chloroform except in cases of pulmonary trouble and in operations about the face and neck.

THE CONDITION OF THE KIDNEYS IN URETERO-ABDOMINAL FISTULA.

NEUMANN (*Archiv für Gynäkologie*, Band xlvii. Heft 3) infers from his experimental studies of this subject that after extirpation of the kidney on the affected side it is highly important to watch the urine carefully in order to detect evidences of beginning nephritis in the remaining organ. It is advisable to keep the patient on an exclusive milk-diet until it is certain that the organ is fully able to perform the extra work necessitated by a general diet.

ABDOMINAL HYSTERECTOMY IN SEPTIC AFFECTIONS OF THE UTERUS AND ADNEXA.

DELAGÉNIÈRE (reprint from *Archives provinciales de Chirurgie*) favors abdominal rather than vaginal hysterectomy in such cases for these reasons: 1. The possibility of doing a conservative operation after opening the abdomen. 2. Greater ease in removing diseased organs under direct control of the eye. 3. Absolute prevention of hemorrhage and the possibility of covering denuded surfaces with peritoneum. 4. Easier separation of intestinal adhesions and less danger of tearing the gut. 5. The use of ligatures instead of forceps, thus giving less pain to the patient.

SURGICAL TREATMENT OF UTERINE FIBROIDS.

HOMANS (*Boston Med. and Surg. Journ.*, 1895. No. 10) reports twenty-six operations in private practice, with one death. He ligates the broad ligaments and dissects off an anterior and posterior peritoneal flap in the usual way, and performs supra-vaginal amputation of the uterus. After cauterizing the cervical canal he closes it by suturing the raw edges of the stump, being careful not to enter the canal, then unites the peritoneal flaps over it with fine silk, being afraid to use catgut for this purpose.

PÆDIATRICS.

UNDER THE CHARGE OF
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ASSISTED BY
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STRANGULATED HERNIA IN A CHILD.

CHARLES F. JUDSON (*Archives of Pediatrics*, December, 1894) reports a case of strangulated hernia in a male child four years old, occurring in the service of Dr. Samuel Ashhurst, at the Children's Hospital of Philadelphia. Previously to the onset of the trouble he had been a healthy child, never sick except for a mild attack of measles, and his mother had never observed any swelling in the groin. Two days before admission to the hospital he had become wedged between the seat and arms of a chair, and had to be extricated forcibly. On the following day the bowels were constipated, urine scanty, severe pain in the abdomen was complained of, and vomiting began. These symptoms continued the next day, when the matter vomited became sour-smelling and bilious in character. On admission to the hospital there was marked swelling in the left inguinal region over the middle of Poupart's ligament. Taxis and ice having failed, Dr. Ashhurst operated and readily reduced and returned the protruded gut. The peculiarity in the case was the absence of anything like a thick sac. The protrusion having been so recent, the hernia had only started down in the course of the cord, the outer and inner rings being distinctly recognizable and separated from each other about three-quarters of an inch. The wound was closed with buried sutures and drained. Somewhat less than a pint of urine was voided during the night. On the second day a mild orchitis ensued, but subsided under the use of a lead-and-laudanum dressing. The catheter was required for several days. Convalescence was rapid, and the boy was discharged at the end of six weeks, wearing a truss. Six months later, when last seen, he had experienced no further trouble.

A CASE OF CONGENITAL SARCOMA OF THE SMALL INTESTINE.

STERN (*Berliner klinische Wochenschrift*, 1894, No. 35, p. 802) records an extremely rare, and possibly unique, case of primary sarcoma of the small intestine in a newborn baby. The child was born, after an easy labor, of a healthy primipara of twenty-three years, and presented no apparent abnormality. Shortly after birth, however, it was noticed that no meconium was passed, and bile stained matter was vomited. The belly was swollen but soft, and revealed nothing to palpation. There was no abnormality of the rectum or anus. On the following day the child vomited thrice spontaneously, and also after every ingestion of nourishment. The bowels were still unmoved, though the urine was passed freely. Vomiting continued, and the bowels remained locked, except for a small constipated movement produced by glycerin injection. Death ensued on the fourth day.

The autopsy revealed a tumor of the small intestine, situated 132 cm. from its beginning, and occupying transversely 4 to 5 cm. of its lumen. This growth was a broad sessile tumor rising 1½ cm. above the general surface of the mucous membrane, and involved all the coats except the peritoneal, consisting of a very marked, round-celled infiltration with great overgrowth of the capillary vessels in the outermost zone, the whole corresponding closely to Kolaczek's picture of angio-sarcoma. All the other organs were healthy, and no metastases were found.

The author calls attention to the great rarity of primary sarcoma of the intestine at any age, Madelung, in a paper in the *Centralblatt für Chirurgie*, 1892, No. 30, having collected but fourteen undoubted cases, and of this number only five, including the case just reported, have occurred in children under ten years of age.

The case is also of interest in that it demonstrates the possibility of another causation for ileus in the newborn, and that is, a tumor of the intestine itself.

In eight of the reported cases collected by Madelung Baltzer (*Archiv f. klin. Chirurgie*, Bd. 44) found that in three the mucosa and in five the submucosa of the intestine were the starting-points of the growth. A case recorded by Lehmann, in his inaugural dissertation (Würzburg, 1888), was classed as an "interfascicular endothelioma" arising from the lymph-vessels of the submucosa. The author's case, unfortunately, could not be properly studied from this point of view, owing to the method of the preparation of the specimen, but hyaline degeneration of the vessels and of the connective-tissue stroma was made out; and this, according to Lubasoch, is almost constantly observed in angio-sarcoma and endothelioma.

CARDIAC IRREGULARITY IN CHILDHOOD.

HEUBNER (*Zeitschrift f. klin. Medicin*, Bd. xxvi. H. 5 u. 6) contributes an important study under this heading. He excludes cases of arhythmia due to tubercular meningitis and to pronounced cardiac inflammations, and distinguishes eight classes: 1. The simplest case is that of irregularity after poisoning. An instance is quoted of a child who had eaten stramonium-seeds; on the third day there was decided irregularity of the pulse, which disappeared on convalescence. Large doses of digitalis and of opium have been noticed to produce the same effect. 2. Closely allied are cases of disturbed rhythm from digestive troubles. Recent investigations suggest in many severe forms of indigestion the circulation of some poison in the blood —a form of auto-intoxication. He gives an example in a child of six years suffering from gastric disorder, who began to show cerebral symptoms, vomiting, etc. There were rise of temperature, very irregular, intermitting pulse, retraction of the head, and drowsiness. It was regarded as a case of auto-intoxication, and this was confirmed by the favorable issue and the appearance of acetone in large amounts in the urine. Another case showed a slow, unequal heart-beat. 3. Cardiac irregularity may be met with in abdominal affections where no grounds exist for considering it due to poisoning. A case of appendicitis, in a girl of eight years, is quoted; decided intermittency of pulse was present, and also on a second occasion after an attack of indigestion. 4. Arhythmia in the course of infectious diseases is divided by Heubner into two groups—(*a*) that during the development and height of the disease; (*b*) that observed during convalescence. The first group is much the rarer. Many observers mention it in typhoid fever, but Heubner has had no experience of it. The second group is well recognized. In diphtheria it is often present, and also not infrequently in scarlet fever, of which several instances are quoted; measles and croupous pneumonia frequently give rise to it, and sometimes it has been observed by the author late in typhoid fever. 5. In anæmic and nervous children irregularity is frequently noted, and is apt to lead to a false diagnosis: in rhachitic, feeble children, from two to four years old, such irregularity is too readily accepted as an indication of the imminence of tubercular meningitis. 6. Intestinal parasites are said to cause irregularity of pulse, but no evidence of it has occurred in the author's experience. 7. Under certain physiological conditions irregularity may be observed, as in emotional states, sometimes during sleep, and occasionally following a warm bath, with subsequent cooling. 8. Da Costa has described a disturbance of rhythm which appears to be the only element of disease, the child seeming otherwise well, and all the other causes being satisfactorily excluded. During febrile attacks the irregularity disappeared.

Discussing the mechanism of irregularity under these various conditions, Heubner refers to nerve-influence—a disturbance of the regulating nerves of the heart. This is the explanation accepted for tubercular meningitis, increased intracranial pressure affecting the centres in the medulla. Irritation of peripheral nerves, such as the splanchnic depressor, disturbs rhythm, and would account for a continuance of such a symptom with nausea and vomiting. When due to poisoning the explanation is more difficult; but it is probably a result of action upon the nerve-centres or the cardiac muscle. The cause of arhythmia in anæmic, rapidly growing children is involved in doubt, though the suggestion of a relatively small arterial system is founded on experimental evidence.

The treatment of cardiac irregularity in children requires a careful consideration of causes. If reflex, the irritant should be removed. When due to poison, the stomach and intestines should be emptied and a plentiful supply of water should be given to cleanse out the system. The idiopathic form requires moderate movement, light gymnastics, frequent small meals, and sea-baths. The anæmic variety demands suitable diet, hygiene, and medical treatment.

SOME PECULIARITIES OF GRIPPE-PNEUMONIA IN CHILDREN.

CLÉMENTE FERREIRA, of Rio de Janeiro (*Revue Mensuelle des Maladies de l'Enfance*, March, 1895, p. 105) gives a striking picture of the peculiarities of broncho-pneumonia in children observed in connection with epidemic influenza. In numerous cases, together with dyspnœa, supra- and infra-sternal depression, subcrepitant râles, and blowing breathing, the temperature has not exceeded 99.6° F., or even 98.6° F. In a process habitually attended with high fever such a depression of temperature must be accounted for by a paralysis of the thermogenic centres produced by the influenza-poison. In such cases the low temperature may occasion unfortunate errors of prognosis, unless the physical signs, the dyspnœa, and the progressive adynamia be taken into account.

Another peculiarity is the early tendency to bronchoplegia and pulmonary collapse due to the general adynamia which is the keynote of influenzal infection. This collapse is indicated by feebleness and even suppression of respiratory sounds and by the absence of cough, an unfortunate condition that can do much in giving the mother a false sense of security at a time when the organic condition is extremely grave. Infrequency of cough is the result of diminished sensibility of the bronchial mucous membrane, and constitutes in these conditions a phenomenon of bad omen. Stagnation of the bronchial secretions thus acts mechanically in diminishing the field of blood-aëration and aggravating the dyspnœa; and, on the other hand, the toxins existing in these products are reabsorbed and provoke marked symptoms of general intoxication.

A third peculiarity is the extraordinary slowness in the evolution of these catarrhal processes in the child. The steps of evolution of the morbid process do not develop as ordinarily. Secretion is long delayed, and for an unusual length of time is stringy, dense, adherent, resembling white of egg, difficult to bring up despite the use of the ordinary relaxing expectorants.

In this connection the author strongly protests against the untimely use of emetics and antimonials. In the broncho-pulmonary determinations of influenza in children, as well as in all infectious broncho-pneumonias, one frequently observes decided aggravation of the symptoms after the use of emetics, which are too often administered in excess. In these cases vomiting is effected with difficulty on account of the great organic asthenia. The energy for the production of active reflexes is here wanting, and, as a result, the emetic is repeated again and again, with only an aggravation of the phenomena of the general adynamia and pulmonary collapse. The indication here is for the early employment of expectorants and excitants of the muscular structure of the bronchi: preparations of ammonia, benzoic acid, tincture of phosphorus, and also injections of camphorated oil, caffeine, and alcoholics in high dose and concentrated solutions. This treatment should be carried out from the beginning with energy, regularity, and persistency.

Lesions of the Right Heart in Pertussis.

Silbermann (*Archiv f. Kinderheilkunde*, 1894, Bd. xviii. S. 24) bases a suggestive study under this caption upon five observations of pertussis complicated in the third or fourth week with albuminuria, broncho-pneumonia, and dilatation of the right heart. The cardiac lesion is attributed to two factors: (*a*) the extended, diffuse, capillary bronchitis; and (*b*) the forced expirations which call into play all the respiratory muscles, and are interrupted only from time to time by short inspirations. The bronchitis of the finer tubes with foci of broncho-pneumonia produces a venous stasis in the pulmonary capillaries, and this in turn an overloading of the right heart and the general venous system. Stasis alone, however, cannot produce dilatation of the right heart, but requires the co-operation of the forced, prolonged, apnœic expirations of the kink. At each paroxysm, when the child becomes apnœic, the glottis closes, intrapulmonary pressure increases with the narrowing of its capillary circulation, and as a result the right ventricle yields gradually to the strain and dilates.

One of the five children died. At the autopsy the walls of the right heart were found to be thinned and its cavity considerably dilated. The myocardium and orifices and even the valves were anatomically normal; the tricuspid alone was mechanically insufficient by reason of the dilatation of the right ventricle. This paper thus emphasizes anew the necessity of watching the heart during the whole course of pertussis, as pointed out several years ago by Koplik, and of supporting its strength by the early administration of digitalis as soon as signs of venous engorgement become noticeable.

HEMORRHAGIC NEPHRITIS IN DIPHTHERIA TREATED BY ANTITOXIN.

TREYMANN (*Deutsche medicinische Wochenschrift*, December 20, 1894) reports a case of this unusual complication appearing in a child of three years after the use of Behring's serum. Owing to the unfavorable condition of the child in the early days of the disease large doses of the antitoxin were employed. On the fifteenth day a measles-like eruption appeared, with high temperature, and albumin, blood, and casts were found in the urine. Four days later anuria, lasting forty-eight hours, was observed, with œdema of the eyelids. As the nephritis appeared during convalescence and shortly after the last dose of serum, disappearing in an unusually short time, the author feels justified in attributing it to the serum.

In the same journal J. SCHWALBE records a similar complication occurring in a boy of ten and one-half years, suffering from diphtheritic angina and croup, in which tracheotomy was required. This case occurred in 1890, before serum therapy was in vogue, and, as the author remarks, offers a parallel case to the one just recorded. The nephritis appeared on the twenty-fifth day, during convalescence, with the same clinical picture as recorded in Treymann's case, and had nearly disappeared in seven days, although albumin was still found until the twenty-eighth day, while Treymann's case was free from it after the fifth day.

The author remarks that blood very rarely appears in the urine in diphtheria, thus contrasting very strongly with the condition in scarlet fever. He justly maintains that the same caution should be exercised in attributing unfavorable results to the serum treatment as must be taken in accrediting favorable results to it.

RENAL COMPLICATIONS IN VARICELLA.

That varicella may be followed or attended by severe or even fatal nephritis is an observation of quite recent date, HENOCH, in 1884, being probably the first author to call attention to this danger in the disease (*Berlin. klin. Wochenschrift*, 1884, No. 2). He reported four cases, one of which terminated fatally. Since then about twenty-five similar cases have been recorded by various observers, among whom are Clausen, Hoffmann, Rasch, Semtschenko, Rachel, Högyes, Newski, Hagenbach, Demme, and Cassel. The latest report of cases comes from CASSEL (*Archiv für Kinderheilkunde*, Bd. xvii. S. 371), who encountered six cases of renal disease in twelve patients seen during an epidemic of varicella in Berlin in the early part of 1894. The severity of the complication varied from albuminuria to actual nephritis, the earliest observation dating from the fourth or fifth day after the stage of desiccation had begun. Three of the cases were fatal, two of these not directly from nephritis, for one died of catarrhal pneumonia and the other of gangrene and lobar pneumonia, though it is certain that the renal complication largely determined the fatal result The third case, a child ten months old, died from acute nephritis on the twelfth day. Three other fatal cases of post-varicellous nephritis have been recorded by Högyes, Henoch, and Hagenbach. The two latter observers speak of acute parenchymatous nephritis, whilst Högyes states that in his case the convoluted tubules and loops of Henle were alone affected. The obvious lesson of these cases is that the urine, in a case of varicella, should be as carefully watched as in a case of scarlatina.

PATHOLOGY AND BACTERIOLOGY.

UNDER THE CHARGE OF

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ALBUMINURIA.

Three questions relative to albuminuria are discussed by PROFESSOR OTT, in a paper in the *Deutsches Archiv f. klin. Med.*, 1894, liii., 604–*i. e.*: 1. The relative value of the various tests for albumin in the urine; 2. Alimentary albuminuria; and 3. Intermittent albuminuria.

Sixteen different tests for albumin were carefully compared in examinations of forty-eight specimens of urine from various sources, thirty of which contained more or less albumin. Twelve of the specimens contained so small an amount of albumin that the ordinary boiling and nitric acid test gave no indication of its presence. These were, of course, particularly well adapted to tests of the delicacy and reliability of some of the more recently advocated reactions. On the whole, Spiegler's reagent was found to give the most delicate reaction, though the sulphosalicylic acid test and Millard's and Tanret's tests were found to be very delicate and reliable. Because of its delicacy, portability, and ease of application, Ott is of the opinion that the sulphosalicylic acid (also called salicyl-sulphonic acid) test is destined to become very popular with clinicians. It may be easily employed at the bedside, requiring only a test-tube and a few crystals of the reagent. These latter are placed in the test-tube, and urine, which should be filtered beforehand unless perfectly clear, is added. Sulphosalicylic acid is very readily soluble in water. As it dissolves a distinct cloudiness is caused if albumin is present. By this test it is also possible to differentiate the ordinary albumin (albumin and globulin) commonly present in albuminous urine from the albumoses and peptones occasionally met with, since the precipitate of the latter disappears on heating to the boiling-point, coming down again on cooling.[1]

Ott has no doubt of the occurrence of an alimentary albuminuria dependent upon the ingestion of proteids in excess, particularly when uncooked. This opinion is based upon the results in fourteen cases experimented upon, in all of which traces of albumin were found in the urine in from four to six hours after the ingestion of uncooked egg-albumin. The condition is, however, but transitory, and would appear to be of no importance in the production of disease of the kidney, and to have no diagnostic significance as regards nephritis.

Under the heading "intermittent albuminuria," Ott includes those cases which have been designated "cyclic" by Pavy, "functional" by Raabe, and "transitory" by Kinnicutt. This condition is believed to depend always upon inflammatory change in the kidney, often very slight in extent. The quantity of albumin in the urine is extremely variable, and would seem to be governed by no rule. It is not dependent on the character of the food as is the alimentary albuminuria, and is increased with great regularity by exercise, often almost entirely disappearing as the result of rest in bed. Usually casts and renal epithelium are present in the urine at some time in the course of the disease, though they may appear and disappear most irregularly.

THE RELATION OF THE TONSILS TO TUBERCULAR GLANDS OF THE NECK.

With the growth of our knowledge of the paths of entry of the tubercle bacilli into the body, and of the manner of their dissemination in the body, there has developed the belief that tuberculosis of the lymphatic glands of the neck, so often met with in young persons as the only discoverable lesion of tuberculosis, must be attributed to entrance of the bacilli into the body through the oral or pharyngeal mucous membranes. Proof of this ha[illegible] however, been lacking, and experimental attempts to induce tuberculosi[illegible] the glands in question by introduction of tubercle bacilli into the tons[illegible]ve failed.

It is with much interest, then, that we read the observations of KRÜCKMANN (*Virchow's Archiv*, 1894, cxxxviii. 534), made in the course of post-mortem examinations upon the bodies of twenty-five tubercular patients at the Pathological Institute in Rostock. In twelve of the cases it was possible to demonstrate tuberculosis of the tonsils, and in every case in which the lymph-glands of the neck were affected. In two of the cases there seemed to be no question that the lesion in the tonsils was the primary tubercular lesion of the body. In sixty per cent. of the cases of pulmonary tuberculosis similar inflammation of the tonsils was present, in many of these cases undoubtedly depending on absorption of the infectious material from the sputum. Krückmann expresses the belief that tubercular changes in the tonsils would have been more frequently found if serial sections of the tonsils had been made in all cases. The importance of the tonsils as a point of entrance of the tubercular virus would appear to be very clearly demonstrated. This is quite reasonable, for there can be little doubt that throughout the alimentary tract it is the lymphatic structures which are first involved when the infectious material finds entrance from the alimentary canal, and, in the mouth, the tonsils are the most important of these structures.

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[1] For further details of this useful test the reader is referred to an article by J. A. Macwilliam in the British Medical Journal for April, 1891, No. 1581.

As a practical deduction from all this Krückmann advocates extirpation of fissured and hypertrophied tonsils, particularly in persons having any inherited predisposition to tuberculosis or whose cervical glands are enlarged, and he would have the surgeon operating for tubercular glands at the same time carefully examine the tonsils for any evidence of inflammatory change.

Streptococcus Infection from Mother to Fœtus.

Direct infection of the fœtus by the mother has been clearly shown in a number of diseases, but, so far as we know, there has been no record of such infection with the pyogenic bacteria until the recent publication of a case of that nature by Ricker (*Centralbl. f. Allg. Path. u. Path. Anat.*, 1895, vi., No. 2).

A woman, twenty-seven years of age, died in the sixth month of pregnancy of a disease diagnosticated diphtheria, but which was later shown to have been caused, in all probability, by the streptococcus pyogenes, as the most careful bacteriological examination failed to reveal the presence of any other germ. The streptococcus was also obtained in pure culture from the placenta and from the liver of the fœtus. No lesion was found in the fœtus.

A second similar case, which had occurred some time previously, is recalled by Ricker, in which the streptococcus was found in the blood of the umbilical veins of a stillborn child whose mother died shortly afterward from the effects of a spreading phlegmon of the arm which was present at the time of the birth. In neither of these cases was any lesion of the placenta discoverable.

The significance of these cases as bearing upon septicæmia neonatorum and upon puerperal septicæmia is evident.

The Contagiousness of Tuberculosis in Young Children.

A case of tuberculosis in an infant, illustrative of the contagiousness of tuberculosis and of the peculiar susceptibility to it of young children, is reported by Wassermann (*Zeitschr. f. Hygiene u. Infectionskrankeiten*, 1894, xvii. p. 343).

The child was born of a healthy mother in the Charité, was apparently healthy in every particular, and after nine days the mother and child were discharged. For a week after leaving the hospital they visited a brother-in-law of the mother, who had phthisis and was accustomed to expectorate into a box filled with sand. The mother then found lodgings of her own. Soon after leaving her brother-in-law's she noticed that the baby coughed and was emaciating, and took it to the Institute for Infectious Diseases.

Four weeks later it died. Autopsy showed a number of diffuse tubercular areas in the upper lobe of the left lung, and miliary tubercles in the other lung, in the liver, and in the kidneys. The bronchial lymph-nodes, while hyperplastic, were not cheesy. There could be little doubt that the infection had occurred through inhalation of tubercle bacilli which had been thrown off by the phthisical uncle. Investigation showed that both parents were healthy, and no ground for supposing any inherited predisposition in the child to tuberculosis could be found. During the nine days after its birth, while it was still in the Charité, there was nobody in the ward who had cough and expectoration. The tubercular nature of the uncle's malady was proved by examination of his sputum. And, finally, the apartment occupied by the mother after leaving her brother-in-law's had never had an occupant afflicted with phthisis.

Wassermann believes that a similar definite source of infection might be found in almost all cases of tuberculosis in young children if only carefully sought for.

WE have recently received from Messrs. Macmillan & Co. a small *Manual of Practical Morbid Anatomy*, by ROLLESTON and KANTHACK, recently issued as one of the volumes of the Biological Series of the Natural Science Manuals. It is a handy guide to the post-mortem room, its object being to indicate a systematic and convenient method of performing the autopsy, so that every organ may be thoroughly examined, and to point out what morbid changes to look for in each organ. We are glad to find the authors deprecating the wholesale slashing of organs at the autopsy, which too often renders valuable specimens wholly unfit either for the more careful examination which can only be made in the laboratory or for preservation as museum specimens. The cost of the book is small ($1.60), and in it will be found many valuable suggestions to those who have to conduct post-mortem examinations.

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